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Br. Lewis

— 6

1831

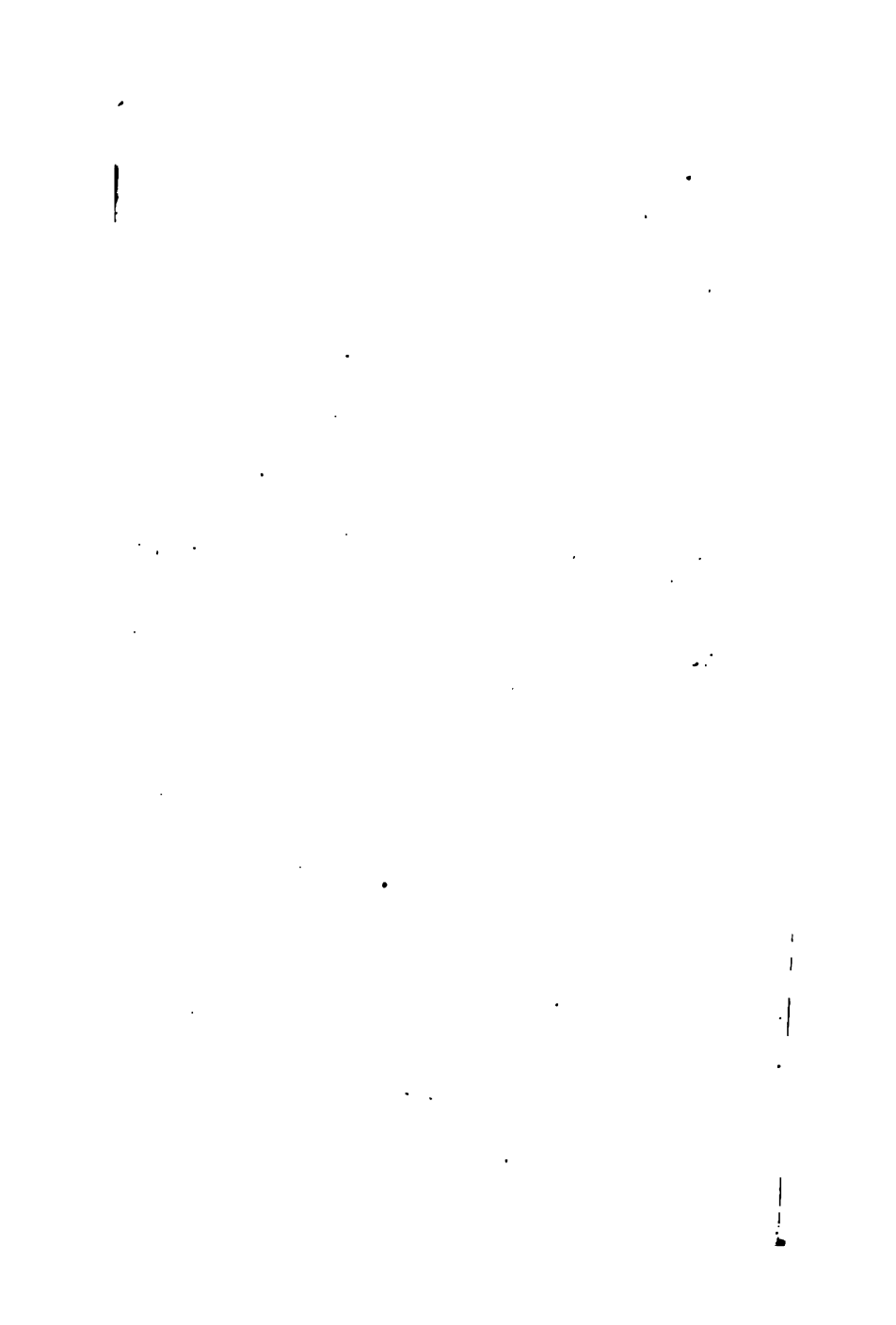


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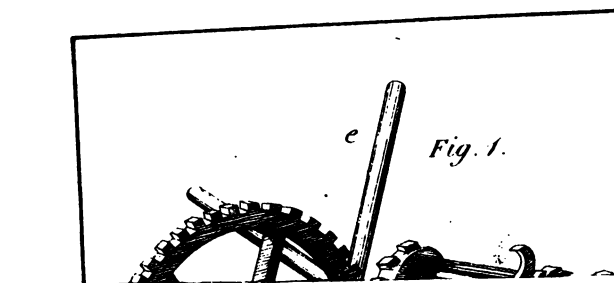


Fig. 1.

1
1831.
MECHANICAL IMPROVEMENTS

CONNECTED WITH

THE ROYAL NAVY.

Which have been submitted to the Honorable

Admiralty, Navy, Trinity and India Boards,

AND, ALSO, TO THE SEVERAL

COMMISSIONERS OF PLYMOUTH DOCK YARD,

Some of which have been rewarded by the

Society of Arts, Manufactures, & Commerce,

From the Year 1814 to 1830,

WITH DESCRIPTIVE DRAWINGS.

BY JOSEPH BOTHWAY,

ROYAL NAVY.

LONDON:

MICHAEL STAUNTON, 1, CRAVEN STREET, STRAND;
SOLD BY W. COLMAN, 48, FORD STREET, DEVONPORT.

1831.

26.

1888

1



TO

THE RIGHT HONOURABLE

SIR GEORGE COCKBURN, G. C. B.

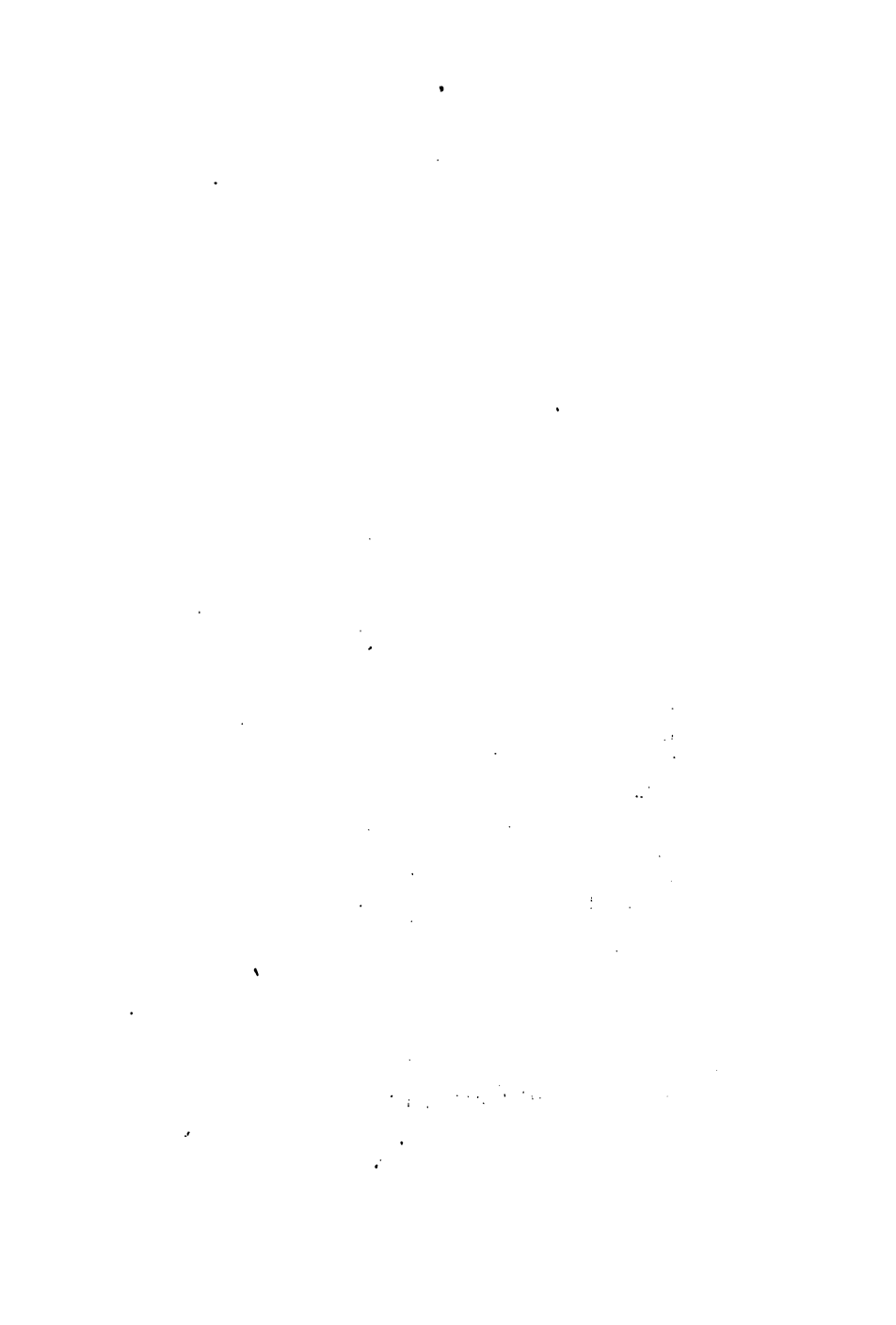
VICE-ADMIRAL OF THE WHITE.

SIR,

IN most respectfully dedicating this small work to you, may I be permitted to express a hope that it may be found not wholly unworthy the patronage which you have vouchsafed to some of the Inventions, a description of which it contains, and for which you will condescend to accept my humble and sincere thanks.

That you, Sir, may long live in the enjoyment of health and happiness, and that high character which the knowledge of the services rendered to your country, never fails to secure, is,

Sir,
the ardent wish of
your most grateful
and obedient Servant,
J. BOTHWAY, R. N.



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PREFACE.

IN presenting to the public this small work on *Mechanical Naval Improvements*, the writer begs to throw himself upon the candour and liberality of his readers, trusting that they will not criticise its merits too severely ; he does not presume to claim any consideration as a writer, only, so far as a true description of the Inventions may give him, and which, he hopes, may prove of some service to that profession to which he has the honour to belong. He takes this opportunity of stating that he has been induced to lay this work before the public at the request of many friends who have seen his former publication, which will be found at the end of this work. He trusts that this addition will prove more acceptable, and also more fully elucidate the several subjects, to which it refers, for the use of those who may think proper to adopt any of them as improvements.

Journal of Management Education 30(6)p.789-804
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MECHANICAL IMPROVEMENTS.

Method for Destroying Powder in the Ship's Magazine in the Event of Fire.

IT is well known, that in case of fire, before the water can be brought to drown the Magazine, it has to floor the whole of the ship; by this plan it can be brought immediately to it, which would be a greater stimulus for the men hanging on longer to the ship and would require no other attention than for the Gunner to act, the moment the Captain gave the order to destroy the powder. By this method the water would be solely confined to the Magazine.

Invented in the year 1814.

Reference to the Plate. Fig. 12, 13, 14.

Fig. 12. Longitudinal section of a ship's magazine.

Fig. 13. Transverse section of do.

Fig. 14. Plan. (The same letters refer to the same part in each figure.)

- p. Pipe through the ship's sides.
 - q. Copper cistern, two inches deep, over the powder racks, within the Magazine, with its bottom pierced with holes, to ensure an equal distribution of water over the powder.
 - r. Stop-cocks to prevent or admit the water.
-

Cartridge for Great Guns.

THIS is intended for keeping up a smart fire in first coming into action, it only requiring one motion for cartridge, shot, and wad: it was tried in His Majesty's ship *TIGRESS*, in the Cove of Cork, where the difference of firing was nearly three shots to one; of that on the old plan.

Invented in the year 1814.

Reference to the Plate. Fig. 29.

- f. Flannel bag, attached to the inner end of a tin case i.
 - g. Wood-stopper for filling the case.
 - h. Lanyard for drawing the charge when required.
-

Machine for setting up a Ship's Lower Rigging.

THIS machine can be used in first fitting out for well sweating the rigging down, and never requires more than a few of the fore-castle men for the fore, a part of the Gunner's crew for the main, and three

or four men for the mizen ; it was also found by being bolted to the Deck, to answer remarkably well for setting up the stays, by applying one tackle to it, and when short handed in fitting out, to sway up masts and yards, as well as many other purposes. Weight of the machine 3 cwt. 3 qrs. 12 lbs. width, 23 inches, length, 3 feet, made in metal. This was tried in His Majesty's ship IMPREGNABLE. See Certificates.

Invented in the year 1819.

Reference to the Plate. Fig. 1.

- a.* Hole in the frame for securing the machine to the shroud.
- b.* Barrel to which the lanyard is brought after passing under the roller *c.*
- d.* Ears to the frame for bolting the machine to the deck, if preferred.
- e.* A cross lever instead of a common handle to work between the shrouds.
- f.* Handle to be worked above the Hammock-boards if the machine is suspended to the rigging, and on deck, if that situation is preferred.

Cover for a Musket Lock.

THIS cover is intended for wet weather on particular service ; the musket can be loaded with it on, with as much facility as when off, and it is secured with the lock screws.

Invented in the year 1820.

Reference to the Plate. Fig. 16.

- x.* Lid for priming.
 - y.* Tube for clearing the smoke.
 - z.* Lanyard for cocking the lock.
-

An Anchor fitted with Span Shackles.

By this method the ring of the Anchor would come close up to the cat head, ready to receive the stopper, consequently much time is gained in hooking the fish and securing the anchor. The anchors of His Majesty's sloop, HARLEQUIN, were fitted on this principle.

Invented in the year 1826.

Reference to the Plate. Fig. 24.

- n.* Shackle on each side of the stock of the anchor to receive the hook of the cat block instead of hooking it to the ring of the anchor.
-

Metal Cat and general purpose Blocks.

THESE blocks have been in use in the Navy for four years. From their durability and the number of purposes to which they can be so easily converted, they are considered of the greatest utility by a number of the most experienced officers in the Navy, and as they will considerably lessen the number of large class spare blocks, and can be stowed away in so small a compass to

that of the present ones, it is generally thought they are likely to be of great public benefit.*

Invented in the year 1826.

Reference to the Plate. Fig. 25, 26, 27, 28.

Fig. 25. Side view of metal cat block.

Fig. 26. Front view of do.

Fig. 27. Shackle, adapted to ship in the place of hook *b* by removing pin *a* for rope strapping, &c. &c.

Fig. 28. Small hook for various purposes, whereby they may be converted into general use.

Machine for Training Young Seamen to the use of the Hand Lead while the Ship is stationary.

THIS machine is intended to teach young seamen the marks, deeps, &c. on the hand line, when a ship is at anchor in any depth of water she may be lying in. By the first cast the practitioner gets, it will appear she is lying in three fathoms; the machine or line is adjusted by the Quarter-master every cast, until the learner goes through the whole of the deeps, marks, &c. to twenty fathom, when he shoals back again alternately to the three fathoms. *Invented in the year 1826.*

Reference to the Plate. Figs. 4 and 5.

Fig. 4.—*k*. Handle for winding up the line, which in so doing deepens the water.

* The Society of Arts, Manufactures, and Commerce, rewarded this invention with their Silver Vulcan Medal.

- l.* Spill, on which the line is wound.
- m.* Knob for securing the line by a half hitch at any desired length, and unwinding, shoals the water.

Fig. 5. Transverse section.

Vent Stopper for Great Guns.

I believe it is well known that many valuable men in the Navy and Artillery have lost one or both arms, and many have been blown to pieces, by not having the vents of the guns secured in a more effective manner. From my simple plan, it will not only prevent premature explosion, but make a man more at each gun in action. *Invented in the year 1828.*

Reference to the Plate. Figs. 6, 7, 8, 9, 10, 11.

- Fig. 6. Bird's-eye view with the vent closed.
- Fig. 7. Side view.
- Fig. 8. Section.
- Fig. 9. Bird's-eye view with the vent open.
- Fig. 10. Side view.
- Fig. 11. Section. *Note.*—The same letters refer to the same parts in all the figures.
- a.* The gun lock as commonly fitted.
- b.* A stock somewhat similar to the stock of the lock, and secured to the gun by the same screws.
- d.* Vent stopper.
- e.* Swivel-catch to keep the stopper close.
- f.* Spring-catch to secure the swivel and stopper, in their places.
- g.* Pan.
- h.* Lock-screws, which also secure the vent-stopper to the gun.

*A new method for slinging the lower yards, and
also with portable metal gear blocks.*

The straps on the yards combine strength, durability, and neatness.

When the gear and blocks are taken down, a short chain is put up for preventer slings, and should the sea slings be shot away in action, or carried away on a lee shore, the yards can be worked and braced as sharp up with the preventer, as with the sea slings: the gears and blocks when required coming in or going out of port, can be replaced or taken down in about 25 minutes. A drawing is given of the old plan, taken from the slings and gears of His Majesty's Ship *St. Vincent* in 1829. By this it can be seen, which is most likely to be struck with a shot, &c. On this plan if the sea slings should go, the yard will be brought up with only two or three inches drop, with considerable less chance of springing the yard than that of the *St. Vincent*; should her sea slings go when the gears are over hauled and racked for working the yards they will drop from 3 to 4 feet, and of course her courses will not stand well on a wind, when braced up, nor can they brace up so sharp, in consequence of the spread of the rigging with that drop. The time taken in rigging the yards of the *Warspite*, on this principal, then lying at anchor off the dock yard, Plymouth, was so short, that a boat was sent to the dock yard for the blocks and slings, returned, the yards rigged, swayed up, and squared, in *six hours and half*. The reader can judge of the superiority and simplicity of this plan.*

Invented in the year 1829.

* The Society of Arts, Manufactures, and Commerce, rewarded this Invention with their large Silver Medal.

Reference to the Plate. Fig. 17, 18, 19, 20, 21.

Fig. 17. Side view of the ST. VINCENT'S gear blocks and slings

Fig. 18. Front view of Do.

A. Gear blocks and fall

B. Sea slings

Fig. 19. Side view of the new method of fitting gear blocks and slings

Fig. 20. Front view of Do.

Fig. 21. Side view when the gears are taken down.

A. Gear blocks and fall

B. Sea slings

C. Clasp hoop round the yard for the gears.

D. Do. for the sea slings.

E. Wooden wedges whereby the hoops are secured to the yard.

F. Iron bearer to which the sea slings are secured, being of sufficient strength to carry the yard in the event of any part of the chain above it being shot or carried away, until it can be replaced.

G. Chain stays to tressel-trees, set up by two screw eye bolts H thereby taking off the strain from the tressel-trees.

I. Rope slings for the gear blocks

K. Chain preventer or substitute for the gears when at sea, kept so taut as to prevent the yard from dropping more than a few inches in case the sea slings should be shot, or carried away, thereby gaining the advantage of bracing the yard at all times, as sharp up, as though it were suspended by the sea slings alone.

Signal Halyard Block with Swivel.

THIS block is fixed close up under the truck, it has a snug and neat appearance, always acting fair to the work. The flags are hoisted with little labour, and a great saving of rope, particularly in wet weather.

See Capt. Burdett's Certificate, 8th August, 1830.

Invented in the year 1829.

Reference to the Plate. Fig. 22 and 23.

Fig. 22. Side view of Signal Halyard Block, placed so near the mast as not to swivel beyond an angle of about 45 degrees.

Fig. 23. View of do. on the aft side of the mast.

Sheave working in the Mast on a Pivot, for Top and Top-gallant Halyards or Ties.

THIS plan is thought on first view to require so much of the mortise to be cut away as to weaken the mast, which is not the case, as it is only reduced in the centre part of the mast or mortise a very little more for the pivot block, than it is when coppered, it being only the bevel of the fore and after part, that require to be more cut away, so that to whatever angle you take your tie or halyard, it will clear that constant rub against the mast, particularly when braced sharp up, will not only be a great saving of rope, but will require a considerable less number of men to hoist the top or top-gallant sails. In the Sheave at present in use after a little wear, the copper cuts through, and acts as a saw against the tie or halyard, which accounts for so much wear and tear for halyards and tie.—*Invented in the year 1830.*

***To prevent the Hounds of the Top-gallant-mast
being injured.***

THIS simple plan will entirely prevent the hounds from injury, as shown in fig. 2. F. which has frequently been the case, and has been known even when chasing an enemy ; the rigging having slipped over the hounds of the top-gallant-mast after being injured.

Invented in the year 1830.

Reference to the Plate, Fig. 2 and 3.

Fig. 2. *f.* Sheave fitted in a metal frame so as to swivel to an angle of about 70 deg. which will insure its working fair.

g. Metal ring to prevent the hounds from being carried away when swaying up the mast.

h. Plates of iron or metal let into the sides of the mast on which the ring *g.* rests.

Fig. 3. Section of the mast at the sheave hole.

Metal Gun-tackle-blocks.

THESE blocks will do away with strapping, grafting, and pointing, lay snug to the gun-carriage, and having two actions, will always act fair to their work, and save the number of wood blocks, which split in transporting guns. On this principle, the gunner's crew could complete the tackles for a first-rate in two days, whereas on the present plan the same number of men could not do it in less than three weeks.

Invented in the year 1830.

Reference to the Plate. Fig. 15.

As fitted on board Lord Yarborough's yacht.

t. Double block of metal.

u. Single do. do.

v. Eye bolt in the ship's side.

w. Do. do. in the gun carriage.

Note.—The purchase for hoisting the lower deck ports of His Majesty's Ships would be similar with the exception of a double block instead of the single one.

Hauling up Lower Deck Ports.

THEY are simply two double 4½ in. metal blocks as shown in Fig. 25, 26, 27, and 28. They take the same number of men as the present purchase, but they never require fleeting in time of action, to throw the port back to the ship's side in case of boarding,* they lay snug between the beams and clear of the men's hammocks. See letters to Captain Hawker of the *ST. VINCENT*, 26th March, 1830; and Captain Curry, of the *CALEDONIA*, 3rd May, 1830.

Invented in the year 1830.

New method for Top and Top-Gallant sheet blocks.

THE advantage in this new method will be an incalculable saving of rope. The sheet acting on a pivot block, and preventing that constant friction to which

* This Invention will also do away with a great deal of lumber in the lower deck.

the old plan is subject; it will also take a third less number of hands in sheeting home, especially in a strong breeze.

Invented in the year 1830.

Reference to the Plate. Fig. 30.

- Fig. 30. Sheet blocks placed well upon the aft side of the yard so as to swivel to the exact direction of the sheets.
- m. Two eye plates bolted through the yard-arm in which the block swivels.

A Drawing of the plan of a Machine for setting up a ship's lower rigging on the Hydrostatic principle is not given, it being found that, that dispatch which was anticipated could not be made, and the plan failed, the motion being too slow for such a purpose; yet, it proved to be a most powerful and portable machine.

It is important to know that this subject is now in the hands of more able men than the writer of the foregoing articles. See trial in Plymouth Dock Yard, 22 July 1830.

The foregoing articles relating only to Naval Improvement—the writer did not think it necessary to give drawings of other improvements, which, perhaps, can hardly be considered by Nautical Men, as connected with the subject, and to which some of the Certificates attached to this work refer.

MECHANICAL IMPROVEMENTS

CONNECTED WITH

THE ROYAL NAVY,

Which have been submitted

TO THE SEVERAL PUBLIC BOARDS

AND TO THE

Society of Arts, Manufactures, & Commerce,

From the year 1814 to 1830;

WITH OBSERVATIONS

FOR THE GUIDANCE OF FUTURE SPECULATORS

IN MECHANICAL INVENTIONS;

TO WHICH IS ADDED

*An Extract from a Report of a Committee of the House of Commons,
in the year 1829,*

ON THE LAW OF PATENTS.

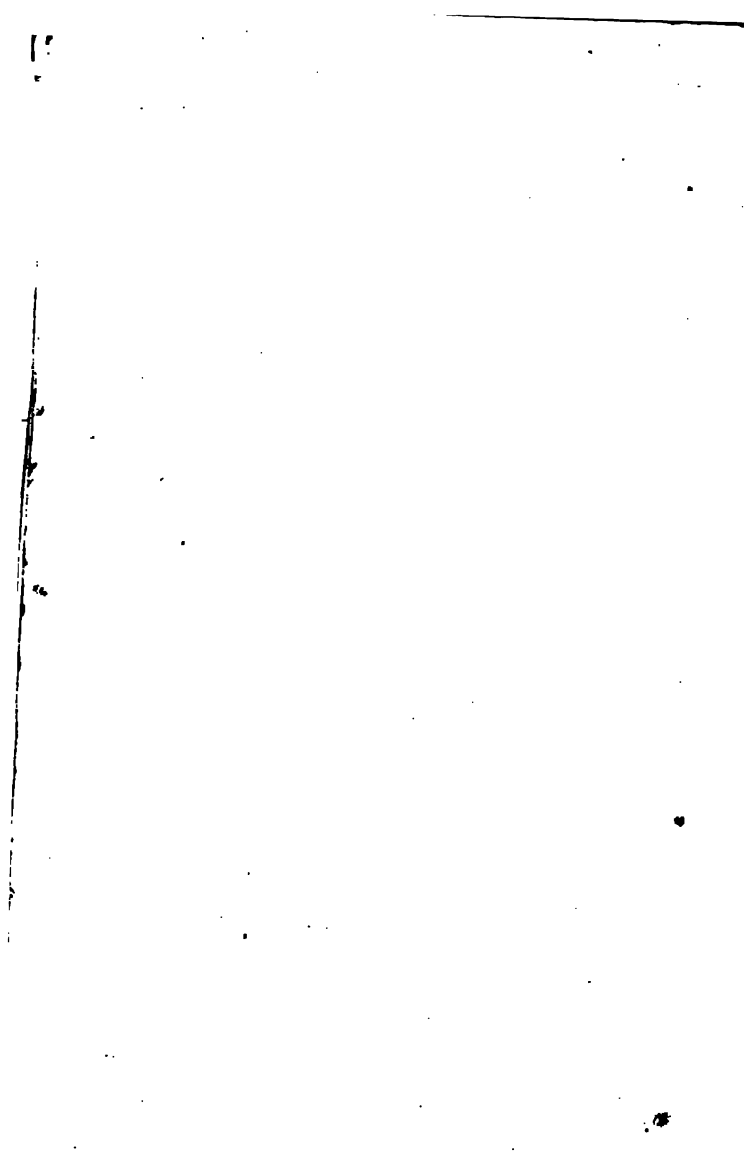
BY JOSEPH BOTHWAY,

Royal Navy.

DEVONPORT:

W. COLMAN, PRINTER & STATIONER, 48, FORE-STREET.

—
1830.



PREFACE.

MY object in submitting this little work to the Public is with an idea that, at some future period, some abler hand than myself will bring some of my principal inventions to more perfection: and I hope that they will ultimately be found useful and beneficial to the service to which I have the honour to belong.

It is too often the case, that inventions are kept secret by the Authors, under the impression that it is impossible to make any improvement; but, differing widely in opinion on that subject, I have, invariably, in all the inventions I have endeavoured to bring to maturity for the use of the Navy and Merchant Service, submitted them, for inspection, to the Nautical Boards in London, to the Society of Arts, &c. and to a number of distinguished and scientific Officers of His Majesty's Navy, residing in this town and neighbourhood; before whom I have frequently attended, with models of various descriptions; and have the satisfaction to say, that I have, in many instances, profitted by their ideas. I speak from experience, and trust it will prove beneficial to future inventors. If I find occasion to approve of their suggestions, I have to alter my model or, in all probability, break it up altogether; which is attended with great loss of time and expense,

which none but those who have been in similar circumstances would credit. Many other inventors have kept their ideas to themselves, in all probability, with a view of taking out a Patent; and it is frequently the case, particularly with Nautical persons, that when their invention is laid before the Public, by some unforeseen occurrence, their Patent is not worth one farthing. I would observe that Nautical men labour under more disadvantage than a mechanic, in bringing forward improvements; and I may say, with safety, that, whatever mechanic may be employed, his profit is greater than the projector's; but it is invariably the case, that the Nautical man cannot do without the mechanic, and may say, *vice versa*.

I must candidly confess, that, in bringing many of my plans to maturity, I received great assistance from Mr. J. MARE, Engineer, of Plymouth, and Mr. J. HEARLE, of Devonport. Many persons have remarked that I must be making a great fortune, but the following is a correct statement of facts:—The Commissioners of the Navy have been pleased to order a number of metal blocks, of my invention, to the manufacturing of which, I have paid the strictest attention; and, being a Public Servant, I have always been cautious of fixing a profit on my inventions, that I might not put it in the power of any person to say my profits are exorbitant. My per centage on the manufacturer's price has not been, to the present time, more than *Seven and half*; and many will scarcely credit my statement, that I have actually supplied this Dock-Yard with blocks, under the manufacturer's price; looking forward

to the hope that, should they be found to answer the purposes for which they are intended, I shall ultimately be remunerated for all the expenses I have incurred, and the trouble I have experienced for many years past.

I have had many prejudiced characters to deal with;* but it gives me some consolation to think that those who have the most practice on the blocks, have given me the most flattering accounts of their merits, and I feel perfectly satisfied, from an inspection that was made on the various-sized blocks of my invention, at this Dock-Yard, by a scientific Officer, one of the Members of a Committee lately formed at Portsmouth, for revising the rigging warrant; and had I been in Portsmouth previous to the day of their breaking up, to explain the many advantages the metal blocks possess over those of the common-sized large wood bound with iron, I have no doubt they would have become more generally used, particularly in ships going on Foreign Stations. It is remarkable, that, without reasoning on the subject, many Officers have said to me, "Your blocks will not answer; the pins, in a short time, will corrode in such a manner as not to be driven out." Then, when I have put the question to them, to state the difference, they have replied, "The pin of the wood block will always drive out, or the block will split:" whereas, they have forgotten that, for many years past, the shivers, and more particularly of the large class wood blocks, have been bushed with brass cogs; and very recently, the shivers of a great number of the different various-sized wood blocks

* See my Letter to Captain King, dated 6th. January 1830.

used in the Navy have been all metal. And I should say, the projector of that plan was a good friend to the Rope-maker, as it will be found, that, as the inner part of the block wears away in bringing the hoisting part of the fall to a certain angle of the block, it will lead across on the upper part of the brass shiver, which must evidently damage the fall.

From the close application and attention paid by me in the manufacturing of different-sized metal blocks, (say from a two-inch to the largest class block used in His Majesty's Navy) I have not the smallest doubt, from the many ships now fitted on trial in His Majesty's Service, as well as many yachts belonging to the Royal Yacht Club, that they will be found the most useful blocks ever manufactured in this Country, in point of strength, neatness, and durability.*

I should feel a pleasure, if any Officer connected with the Navy be bringing forward any improvement for the good of the Service, in candidly giving him my opinion of his Invention, and rendering him such service as my poor ability will admit of. I have frequently found young Inventors led away with the idea that a Patent is a gift; but, as a caution to my Nautical friends, I have caused to be printed, at the end of the Book, an Article on the Law of Patents, from Minutes of Evidence before a Select Committee of the House of Commons, in 1829; which, I hope, will be the means of undeceiving many. It is strange to say, but such is the fact, and the reader may soon convince himself by looking at any

* See Certificate, 27th. May, 1827.

of the iron-bound blocks when they have a strain on them, that none of them act fair to the work: for instance, look at a cat-block when the anchor is suspended, and it will be found that the inner part of the fall bears hard against the upper part of the block, and, from that great friction, it must evidently not only require a greater number of men in catting the anchor, owing to the construction of the hook, but does considerable injury to the fall. In 1829, Mr. Kingston, Engineer of Portsmouth-Yard, whose first rate abilities are well known in His Majesty's Navy, was at this place when I observed to him, that I was of opinion, that there was not an iron-bound block in use in His Majesty's Service, as far as I had seen, that acted fair to its work; and, to convince him, we went down to a Lump then lying alongside the Dock-Yard, with an anchor suspended to the block; where he, in one moment, became of the same opinion as myself; and I now see the iron-bound blocks sent from Portsmouth have undergone the improvement suggested, and, simple as it may appear, it will cause a considerable reduction in the number of men, in catting the anchor, and at the same time be a great saving of Rope.*

I have selected a few Letters, out of the many I have received, to certify that my statements in the advertisement Dated July 15th., 1830, are correct.

* See Certificate Dated 13th. March, 1830.

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MECHANICAL IMPROVEMENTS.

IN THE YEAR 1814.

A PLAN FOR DROWNING A SHIP'S MAGAZINE, AND DESTROYING THE POWDER, IN CASE OF THE SHIP TAKING FIRE.

This Invention was inspected by Admiral Sawyer and the Captains of the Royal Navy then on the Cork Station, who considered it likely to be of great utility to the Service.

AN IMPROVED CARTRIDGE FOR GREAT GUNS.

The gun could be loaded with *this cartridge* by one motion, and would require but one wad. No wooden cases would be necessary for bringing these cartridges from the magazine.

This Invention was also inspected by Admiral Sawyer and the Captains on the Cork station, and was tried on board His Majesty's Ship TIGRIS, in Cork Harbour.

In 1815, the foregoing plans were inspected by Admiral Sir Byam Martin and the Captains then in Plymouth Harbour; at which time, the Inventor also gave in a statement to the following effect, proposing an alteration calculated

TO FACILITATE THE WORKING OF CARRONADES:

That having invariably found, in all our ships, that the bolts in the sides, for the tackles of the carronades, were all considerably too high, occasioning the fore part of the carriage to press hard down on the slide, and impede the running out of the gun after having been fired, I suggested, that if the *bolts in the side were made parallel with those in the carriage*, it would make at least the difference of three men, in first starting the carriage of a 32-pound carronade. Also, that by having a worm for every gun, and no rammer-head on the sponge-staves, the man who loads would not have to turn the staff: a decided advantage in action, particularly on the lower decks of ships of the line.

Admiral Sir Byam Martin was pleased to forward the models and drawings of this plan to the Honourable Boards.

1819.

A MACHINE FOR SETTING UP A SHIP'S LOWER RIGGING.

The model was submitted to the Lords Commissioners of the Admiralty, in the same year; and their Lordships were so far pleased with the plan, as to give directions for the construction and trial of a machine on this principle; in superintending which, I remained in London eight weeks at my own expense. When finished, it was ordered to be tried at Deptford; but the circumstance of part of the machine giving way before the completion of the trial, enabled me to observe that a farther improvement might be made in the machine. I afterwards caused one to be constructed at Plymouth, at *my own expense*, embracing the improvement; and Lord Exmouth having been pleased to allow a trial, on board H. M. S. IMPREGNABLE, I set up the shrouds with *six* men, and *without any tackles*, in the presence of the Captain and Officers.

The same machine was then bolted to the deck, with one tackle applied to the shroud, and the fall brought to the machine: this service was performed by two men, one attending the lanyard, and the other the machine.

A Report of the above was made to the Honourable Board.

Weight of the machine, 3 cwt. 3 qrs. 12 lbs.—Width, 23 inches; length, 3 feet: made in metal.

1820.

A COVER FOR A MUSKET-LOCK, IN WET WEATHER.

This cover, which only increased the weight of the musket 14 ounces, was to be secured and drawn close to the stock, by the lock-screws; and the musket could be loaded with equal dispatch and precision, with, as without the cover.

The model, with a musket, was sent to the Lords Commissioners of the Admiralty, in the same year.

1823.

TWO MACHINES FOR THE USE OF THE ROYAL NAVAL HOSPITALS, VIZ:

One, for raising the patient from his bed, at full length, in case of severe illness, or wounds, for the purpose of making or airing the bed, or of introducing a bed-pan. By this machine, *one woman* can raise the heaviest patient with perfect ease.

The other, for supporting patients in a sitting posture, in bed, and enabling them to vary the position at pleasure, if they have but the use of one hand.

These machines have been supplied to the Royal Naval Hospitals, and several public Infirmaries. They are recommended by the highest testimonials of the

Medical Officers, for their simplicity and utility; and the Society of Arts have also presented to me their *Silver Vulcan Medal*, in approbation of the same, and for the benefit of the Invention to the public.

1824.

AN IMPROVED METAL CAT-BLOCK.

The first model of this invention was accompanied with a recommendation that the block should be of *iron*; and the Honourable Commissioners of the Navy Board were pleased to give directions for the manufacture of a suitable one for a sloop-of-war. I superintended its construction, in London; and, when completed, it was ordered, for trial, on board the *BUSTARD*, at Chatham. Another was subsequently ordered, for *H. M. S. DRUID*, at Plymouth; but, in superintending the trial of the former and manufacture of the latter, I found there was an insurmountable inconvenience resulting from the block being of *iron*,—the requisite thickness not giving a sufficient spread for the mortices in the cat-head, and there being no possibility of rounding the cheeks sufficiently, to prevent the fall from being cut. *Metal*, therefore, suggested itself, as being preferable to *iron*, not only on account of the inconvenience alluded to, but as likely to prove a considerable saving to Government, in its superior durability, and in the value of the old metal when the blocks should have become unserviceable. I was, therefore, induced to have a *metal* block made, on this plan, at my own expense, of suitable dimensions for a sloop-of-war. On its completion, it was submitted to the inspection of Commissioner Shield and the Officers of the Royal Dock-Yard, at Plymouth; and the Commissioner having been pleased to order the erection of a derick, for the trial of its strength, an anchor of *two tons weight*, was hoisted by the metal block, and the fall stopped, so that the parts could be overhauled for letting go the anchor with a heavy surge.

The block having been afterwards examined, and found quite perfect, was ordered by the Honourable Commissioners of the Navy, to be supplied to the first fitting sloop.

I was authorised by the Honourable Commissioners of the Navy, to say to the Officers of the Society of Arts, that *the Reports from the Ships fitted with the metal blocks, were FAVOURABLE.*

The immense strain used, on trial of that supplied to the WARSPITE, together with the information received from some of the other ships fitted, having convinced the Inventor that the blocks contained considerably more substance of metal than necessary; in October, 1827, with a view to the reduction of the expense, a block was made, of suitable dimensions for a sloop-of-war, containing much less metal, and with iron sheaves and brass cogs; thereby reducing the price nearly one half. Commissioner Shield was pleased to order a trial of the same, when an anchor of 56 *cwt.* (nearly three times the burden of that for which the block was intended) was suddenly let go, with a drop of six feet. The block being afterwards examined and found perfect, a Report to that effect was forwarded to the Honourable Commissioners of the Navy Board.

These blocks, having an additional hook, a span-shackle, and a thimble, are convertible to any purpose for which a block is required.

1826.

IMPROVED METHOD OF FITTING THE ANCHORS OF THE ROYAL NAVY.

I forwarded, for the inspection of my Lords Commissioners of the Admiralty, the model of an anchor with *span-shackles* on the stock, for receiving the hook of the cat-block, instead of hooking it to the ring of the anchor. By this contrivance the ring would be brought

up close to the cat-head, and considerable facility would be gained in hooking the fish and securing the stopper.

The HARLEQUIN's anchors were fitted on the above plan, at Plymouth, for trial.

MACHINE FOR TRAINING YOUNG SEAMEN TO THE USE OF THE LEAD, WHILE THE SHIP IS STATIONARY.

My many years of service having enabled me to notice the great deficiency of hands, on board our ships, capable of heaving the lead with that precision necessary in dangerous situations; causing frequently a heavy pressure of that important duty on the competent part of the crew; I was induced to bring forward a simple machine for training young seamen to the practice of throwing the lead well forward, and understanding the marks, deeps, &c. while the ship should remain at anchor, as accurately as though she were going over the ground: the marks, &c. varying as at every cast of the lead.

This machine was sent to the Navy Board for inspection.

1828.

AN IMPROVED VENT-STOPPER FOR GREAT GUNS

To prevent premature explosion of the new cartridge, in consequence of the admission of air into the gun. This Invention suggested itself from my having observed, in the course of many years' active service, the frequent accidents by which men have lost one or both arms, or, in some instances, been blown to pieces, both in the Royal Navy, and in the Royal Artillery.

This machine has been inspected by the Officers who have certified their favourable opinion, as follows:—

"We, the undersigned, Gunners in the Royal Navy, have, on this 26th. day of February, 1828, examined Mr. Bothway's newly-invented Vent-Stopper, on board H. M. S BRITANNIA; and we are of opinion, that it is a very simple and effective way of securing the vents of great guns.

(Signed)

W. THOS. HARE, H. M. S. UNION.
JAMES NINER, ST. VINCENT.
JOHN WEEKS, GENOA.
THOMAS TODD, VENGEANCE.
THOS. SIDGWICK, STIRLING CASTLE.
WILLIAM BURNEY, BRITANNIA.

N. B. By a reference to the List, it will be found that the above are old and experienced Officers.

A MACHINE TO FACILITATE THE LIFTING OF CARCASSES, IN THE SLAUGHTER-HOUSES OF THE VICTUALLING DEPARTMENT.

By this contrivance every butcher will be enabled to lift the carcase, on which he is employed, without any tackles, or any assistance from his fellow workmen; whereas, by the present method, the whole of the butchers are called off from their work, to raise one carcase, to the great delay of the victualling, when many ships are to be supplied simultaneously; and the cattle have been sent in late.*

1829.

A NEW METHOD OF SLINGING THE LOWER YARDS OF LARGE CLASS SHIPS OF H. M. NAVY WITH PORTABLE GEAR METAL BLOCKS.

His Majesty's Ship WARSPITE is fitted on trial.†

In the same year I produced, to Captain Hawker, a Metal Signal Haulyard Block, to come under the truck

* See Letter to Commissioner Sir J. A. Gordon, K. C. B.

† See Letter addressed to the Society of Arts, 25th, November, 1829.

to work on a swivel, for the purpose of doing away with the shivers in the trucks. Captain Hawker so much approved of it as to cause a trial to be made.*

1830.

A NEW MODE FOR GUN TACKLES.†—A NEW MODE FOR HAULING UP THE LOWER DECK PORTS.‡—A NEW METHOD FOR SHIVERS IN MASTS AND YARDS.—A NEW METHOD FOR TOP AND TOP-GALLANT-SHEET BLOCKS.—A NEW METHOD FOR PREVENTING THE HOUNDS OF THE TOP-GALLANT-MAST FROM BEING INJURED, AND PREVENTING THE EYES OF THE RIGGING SLIPPING OVER THEM.§

A MACHINE FOR SETTING UP A SHIP'S LOWER RIGGING.

This Machine was tried, to show its powers, in the presence of Sir G. Cockburn, Commissioner Ross, and a number of Captains in the Royal Navy, July 22nd. 1830. ||

The same machine was tried on the 5th. August, 1830, by permission of Captain Pym, of H.M.S. KENT, for setting up her rigging, being on the Hydrostatic principle, and, of course no limits to its power; but I found, by setting up the rigging by pairs or singly, that the progress of the machine was considerably too slow; and as, on some occasions, great dispatch is required, I considered this experiment to have completely failed. At the same time, I should consider myself wanting in gratitude, were I not to embrace this opportunity of returning my sincere thanks to Captain Pym and his Officers, for the very great assistance rendered me on the above occasion.

* See Letter addressed to Captain Burdett, 17th. September, 1829.

† See Letter to Society of Arts, 25th. November, 1829.

‡ See Letters addressed to Captains Hawker and Curry, 3rd. May, 1830.

§ See Copy of Advertisement from Devonport Telegraph, and Paragraph from Plymouth Journal.

|| See Copy of Paragraph from Devonport Telegraph.

LETTERS AND TESTIMONIALS

In favour of the foregoing Inventions.



APPARATUS FOR THE USE OF INVALIDS.

The SILVER VULCAN MEDAL was, this session, presented to Mr. J. BOTHWAY, of Devonport, Gunner in the Royal Navy, for two species of apparatus; by means of the first of which, an invalid or bed-ridden person may raise himself in bed, from a recumbent to a sitting posture; and by means of the second, one or two assistants may raise from bed a person completely unable to help himself. Models of the apparatus have been placed in the Society's Repository.

THE first of Mr. Bothway's Inventions consists of a web of carpeting, which is placed round the shoulders of the invalid, having a cord attached to it, which cord passes over a pulley fixed in the bed-post. The end of the cord is brought to the hand of the invalid, who, by pulling at the cord, may raise himself in bed, to a sitting posture, without help; and, by letting go the cord, may again bring his body to a recumbent position.

The second Invention is to enable one or two attendants to raise a sick person entirely out of bed, in order to have the bed made, or for other necessary purposes. This is effected by placing two webs of carpeting under the patient, to which are attached cords that pass over a pulley fixed in a moveable jib, or in the ceiling; by means of which, one, or at the utmost, two attendants, can raise from bed any person, however bulky and helpless he may be.—*Transactions of the Society of Arts, vol. xlii.*

Haslar, October 31st., 1824.

SIR,

I have to acknowledge the receipt of your two invalid supporters, ordered to be forwarded to me by the Medical Commissioners of the Navy.

I considered it due to your simple and highly useful Invention, to call their attention to it when they were here a short time since, and I shall have much pleasure in recommending the same whenever the opportunity offers, as doing you great credit, and affording to patients, suffering from weakness, the most desirable and efficient support.

I am, Sir,

Your obedient servant,

(Signed)

J. MORTIMER,

Mr. J. Bothway.

Surgeon, Haslar Hospital.

Naval Hospital, Plymouth,

Nov. 13, 1824.

GENTLEMEN,

Conformably to your directions, we have examined the machine invented by Mr. Bothway, and are of opinion it is an ingenious and useful contrivance for lifting patients, so as to allow the bed under them to be made or changed.

There is a very ingenious machine now in the Hospital, invented by a French prisoner; which, by raising the patient on a frame, is extremely well adapted for placing a bed-pan under him, arranging the mattress, &c., which has the advantage, over that in question, of being worked by one woman.—But the bed cannot be rendered so comfortable as by that of Mr. Bothway, from the intervention of a bottom, or sacking, attached to the frame on which the patient is raised; whereas, in his, the duck, or canvas, is removed after he is lowered again upon the bed. In this respect, and in being more portable, the Invention upon which we are directed to make a Report, has the advantage.

But it might be further improved, by giving greater steadiness to the supporters, by attaching a spreader to it, and by altering the machinery, so that, instead of having two winches, it might be worked by one person, as in that previously alluded to.

We have the honour to be, Gentlemen, &c. &c.

(Signed) D. I. H. DICKSON, *Physician.*
The Honourable S. L. HAMMICK, *Surgeon.*
Commissioners of Copy. M. WALL, CLIFTON.
the Victualling Board.

Royal Naval Hospital, Plymouth,
 31st. January, 1825.

GENTLEMEN,

Conformably to the directions conveyed in your letter of the 15th. November, 1824, we have examined the machine, invented by Mr. Bothway for lifting patients in bed, brought hither on Saturday, after having undergone the alterations suggested; and we are of opinion that it has been considerably improved thereby. The alteration chiefly consists in substituting, instead of two winches, one winch of much greater power; by the means of which the patients can be raised from the bed with great facility; and we should be glad to have one of those machines, in its improved state, attached to both departments of this Hospital.

We have the honour to be,
 &c. &c. &c.

(Signed) D. I. H. DICKSON, *Physician.*
The Honourable S. L. HAMMICK, *Surgeon.*
Commissioners of the Victualling Board.

Victualling-Office, 2nd. February, 1825.

SIR,

It appearing, by a Report from the Medical Officers of Plymouth Hospital, that they are of opinion that the

machine invented by you for raising patients in bed, has been considerably improved by the alterations which have been made therein,—I am commanded by the Commissioners for Victualling His Majesty's Navy, to acquaint you therewith, in reference to my letter of the 15th. November last; and to signify their desire that you will supply another of your said improved machines, for the service of Plymouth Hospital.

I am, Sir,

Your very humble servant,

Mr. J. Bothway. (Signed) M. W. CLIFTON.

Victualling-Office, 10th. August, 1825.

SIR,

Having laid before the Commissioners for Victualling His Majesty's Navy, your letter of the 22nd. ult. requesting their opinion of the merits of the machine invented by you for raising and supporting patients in bed, I am commanded by the Board to acquaint you that the Medical Commissioners having perused the Reports from the Medical Officers of the Royal Hospitals at Haslar and Plymouth, where trials have been made of the machines in question, have expressed their opinion that it is a simple and useful Invention, well calculated to palliate the sufferings of patients, under particular circumstances, and the machines have accordingly been introduced into the Naval Hospitals.

I am, Sir,

Your very humble servant,

Mr. J. Bothway. (Signed) M. W. CLIFTON.

Society of Arts, &c., Adelphi, London,

SIR,

13th. May, 1826.

The Society instituted for the encouragement of Arts, Manufactures, and Commerce, have voted to you their *Silver Vulcan Medal*, or *Ten Guineas*, at your option,

for your apparatus for raising invalids in bed, on condition of your sending, without delay, to the Society, for the use of the Public, a complete model and description of your apparatus; and relinquishing all pretensions to a Patent.

You are desired personally to attend at the King's Theatre, in the Haymarket, on Wednesday the 26th. instant, at eleven o'clock in the Morning, to receive the said reward, from the hands of His Royal Highness the Duke of Sussex, President.

If, from the distance of your residence from London, or from any other valid cause, you are prevented from attending in person, you are allowed to nominate any member or officer of this Society to receive the same for you.

Requesting your answer, in order that Tickets of admission may be forwarded to you, I have the honour to be,

Sir,

Your obedient servant,

ARTHUR AIKIN,

Mr. J. Bothway.

Secretary.

At a Meeting of the Directors of Greenwich Hospital, at that place, on Saturday, the 15th. July, 1826,

The Physician and Surgeons having reported favourably of Mr. Bothway's Invention for invalid supporters, which have been several months on trial, have been pleased to direct you will send another of your machines for raising invalids at full length, for the use of the Surgeon's side of the Infirmary.

(Signed)

J. SAMWORTH.

IMPROVED CAT-BLOCK.

The SILVER VULCAN MEDAL was, this session, presented to MR. J. BOTHWAY, R. N. for his IMPROVED CAT-BLOCK; a model of which has been placed in the Society's Repository.

H. M. S. Bustard, Spithead,
25th. September, 1825.

SIR,

I shall have much pleasure in making a Report on the cat-block invented by you, and, at present on trial in the BUSTARD; the moment further trial shall justify my offering an opinion thereupon: at present, it has only been used once, therefore any Report I could at present make, must be premature. However, as far as I can at present judge, it will far surpass any hitherto in use, and possesses many advantages.

I am, Sir,
&c. &c. &c.

Mr. Joseph Bothway.

W. SANDOM.

COPY.

W. F. CARROLL.

His Majesty's Ship Warspite, at sea,
20th. June, 1826.

GENTLEMEN,

In reply to your letter of the 31st. January last, requesting that the merits of a cat-block invented by Mr. Bothway, might be reported after due trial; I beg to state, that it has answered particularly well, until, from constant use, the pin, on which the sheaves traverse, has bent, thereby rendering the block useless for the time; but this defect, I hope, will be remedied when the ship reaches a port, where we can procure a drill large enough to bore the pin out, (which will not drive) and replace it by a larger and better one; and I should recommend that the pin and sheaves be taken out when the block is not in use.

I am Gentlemen,

The Principal Officers Your most obedient servant,
and Commissioners (Signed) W. F. CARROLL,
of His Majesty's Navy, Captain.
London.

13, Clowance-street, Devonport,
December 16th., 1826.

SIR,

I request that you will lay before the Society for the encouragement of Arts, Manufactures, and Commerce, the accompanying model of an improved metal cat-block, for the use of the Royal Navy, and for the Merchant service, which I have had the satisfaction of inventing, and which, under the sanction of the Public Boards, has already been introduced into several of His Majesty's ships, with every prospect of its proving so eminently useful, as to receive universal adoption.

In the course of a long period of service in the Royal Navy, having observed how many valuable seamen have been lost overboard, when getting under weigh in a fresh gale, in consequence of the unwieldy bulk of the old cat-blocks, I have for several years been labouring to produce something that should obviate this evil; and I trust the invention I have now the honour of submitting, will fully realize the expectations that are formed of it, not only by myself, but also by every experienced Officer before whom the block has been exhibited.

The following are the advantages which my block possesses over that which is now generally in use:

In all large class ships in the Royal Navy, when applying the usual cat-block, the unwieldy nature of the machine requires that two men be sent out on the anchor, (a most perilous service in rough weather,) whereas mine only requires one man at any time; because he has not to sustain the whole weight of the block, as in the former case, but only that of the hook. And in vessels smaller than line-of-battle ships, in blowing weather, when the ship pitches heavily, the anchor may be hooked without the man going on it, by his standing on the head, and guiding the hook of the block to the anchor by a staff and hook, similar to a boat-hook; this facility is gained by the mobility of the swivel in its socket, so that the man has not the weight of the block to turn in order to insert the hook in the ring of the anchor. Should

the anchor be hooked in the dark or otherwise by a turn in the fall, the hook, being on a swivel and joint, will come out before the strain comes on the block; and when the anchor is foul, it can also be hooked with great facility.

In my thirty-two years' service, I have seen the wooden cat-blocks swell so much in cold climates, that the sheaves have become immoveable; mine, being of metal, are not liable to this inconvenience.

In point of strength and capability to bear a sudden jerk, they have been well tried in the Royal Dock-Yard at this port.

The metal blocks being of far less bulk, are considered even lighter than the wooden ones, with their iron bindings, capable of the same service; for example, take the metal block of the WARSPITE, the only line-of-battle ship I have fitted; the wooden cat-block weighed 3 *cwt.* 2 *grs.* 5 *lbs.*, whereas the metal one weighs 3 *cwt.* 1 *qr.* 26 *lbs.*, and this latter is large enough for our first-rates.

Another great advantage may be derived from this Invention: independent of its use as a cat-block, it may be turned into a strap-block, being fitted with two shifting hooks, a span-shackle, and thimble.

The two models herewith sent, namely, the metal block on my principle, and the wooden block, are made on a scale of three inches to a foot, for a large class frigate.

I have had the honour of fitting the following ships in the Royal Navy with these blocks: viz. WARSPITE, DRUID, SUCCESS, HARLEQUIN, BUSTARD, and TRINCULO, all of which, except the latter, that has been recently fitted for the Irish station, are gone on Foreign service.

I have only further to state, that I am ambitious of some mark of approbation from the Society, whose liberality has already been experienced by me, on a former occasion.

I am Sir, &c. &c. &c.

A. Aikin, Esq.

Secretary, &c. &c.

J. BOTHWAY.

Royal Navy.

His Majesty's Ship Boadicea, Trincomalee,
SIR, 18th. January, 1827.

I herewith enclose you a copy of a letter which I have forwarded to the Commissioners of His Majesty's Navy, respecting the cat-block invented by you.

I am, Sir,

Your obedient servant,

Mr. J. Bothway,
Gunner, H. M. S. Valiant.

W. F. CARROLL,
Captain.

27th. April, 1827.

We, the undersigned Officers, do hereby certify that we were present on the trial of the strength of a metal cat-block invented by J. Bothway, R. N., in December, 1825, in His Majesty's Royal Dock-Yard, Plymouth. The above block was made suitable for a sloop-of-war; an anchor of two tons was hoisted up by it, to a crane, the runner was stoppered, and the parts of the fall overhauled; the stopper was then cut so as to enable the anchor to come down with a heavy surge clear from the ground. The block was afterwards examined by the Officers, and was found quite perfect; the Commissioners of the Navy then ordered it to be supplied to His Majesty's sloop Success.

(Signed)

J. JACKSON,
Master Attendant.

N. B. The temporary absence of the other Master Attendant prevented the obtaining of his signature for the present.

Society of Arts, &c. Adelphi, London,
SIR, 31st. May, 1827.

I have the pleasure to acquaint you that the Society instituted for the encouragement of Arts, Manufactures, and Commerce, have voted you their *Silver Vulcan Medal*, for your improved cat block, on condition of

your leaving with this Society a model and description of the same, for the use of the Society, and relinquishing all pretensions to a Patent. You will have due notice personally to attend to receive the said reward from the hands of His Royal Highness the Duke of Sussex, President.

I am, Sir, your obedient servant,
ARTHUR AIKIN,

Mr. Bothway.

Secretary.

Queen-street, Plymouth, 14th July, 1828.

SIR,

Having completed some part of the order I had the honour of receiving from your Honourable Board, suitable for ships of third rate, I place great confidence that they will bear the stress of ships of first rate, but I most humbly beg, Sir, that you will be pleased to cause the Officers to pass their superior judgment on them. I have also completed some sample blocks, for the purpose of getting at the price they can be supplied for to the Navy. The enclosed are the sizes that, to the best of my judgment, will answer from a ten-gun Sloop to a first rate.*

I am, &c. &c. &c.

Commissioner Shield.

JOSEPH BOTHWAY.

Queen-street, Plymouth, 11th. September, 1828.

GENTLEMEN,

I most humbly beg leave to state, that, after I had partly completed your order (given in June last) for cat-blocks suitable to third-rate ships, I deemed it prudent to acquaint Commissioner Shield, by letter, 14th July last, that I had proceeded so far, and was confident that they were sufficiently strong for first-rate ships; but submit-

* See the Scale for metal blocks.

ting to the superior judgment of the Officers of this Yard, sent in blocks, for their inspection, which I considered proportionate from a first-rate to a ten-gun sloop. I therefore take the liberty of submitting to you a copy of the proportions which accompanied the sample blocks to His Majesty's Dock-Yard, here.

The Officers expressed their opinion, there should be a block between a 17 and 13-inch one (say 15 inches to such ships from 1800 tons to 50 guns.*)

From the favourable opinion of the Officers of this Yard, two 17-inch blocks were supplied H. M. Ship *BRITANNIA*, and I beg permission to state, that yesterday I had them examined, after coming off her cruise, in the presence of Captain Hawker, Commander Blight, and Officers, when all the parts were found quite perfect; but the Officers were of opinion that the hooks should be a little stronger (say quarter inch more, from seventy-fours to first-rates.)

From the close application I have made during the last three years, and the frequent opportunities I have had in witnessing their trial on board, in getting under weigh the several ships furnished with them, I feel persuaded there cannot be any further improvement than a slight addition of strength to the hooks of the 10 and 17 inch blocks.

Should your Honourable Board be pleased to favour me with a further order, you may place full reliance on my most faithful attention to its execution.

I humbly beg leave to suggest, that were all the spare cat and top tackle-blocks fitted in the same way as the 10-inch cat and general purpose block left by me at your Office in May last, the spare blocks could then be converted to any purpose which may be required of them.

I have the honour to be,
The Honourable

Gentlemen,

*Commissioners of
His Majesty's Navy.*

Yours, &c. &c.

J. BOTHWAY.

* See Scale of metal blocks.

H. M. S. *Britannia*, 29th. October, 1828.

These are to certify that the metal cat-block, invented by Mr. Bothway, was under trial on board His Majesty's Ship *BRITANNIA*, in Tor Bay and Plymouth Sound, and that it was found to answer its purpose well. The block in question may be considered to have a decided superiority over the old block, in other respects, as it can be applied to various purposes without the least inconvenience.

D. M. LYE, *Master*.

Admiralty Office, 14th. August, 1829.

SIR,

My Lords Commissioners of the Admiralty having had under their consideration your memorial dated the 6th. of last month, praying some remuneration for the improvements you have suggested in the blocks used in His Majesty's Ships, and especially for the metal cat-block now generally adopted; I have their Lordships' commands to acquaint you, that they have directed the Navy Board to present you with £100 as a token of their approbation of your ingenuity and persevering attention to mechanical improvements.

I am, Sir,

Mr. J. Bothway;
Gunner, *Plymouth*.

Your very humble servant,
J. W. CROKER.

Navy Office, 2nd. September, 1829.

MR. BOTHWAY,

I am commanded by the Commissioners of the Navy to acknowledge the receipt of your letter of the 30th. ult., and to send you the enclosed bill of £100 as a reward for your inventions of the metal cat and gear-blocks.

Gunner,

I am,

H. M. S. *Valiant*.
Queen-street, Plymouth.

Your most obedient servant,
J. N. MORTON.

Queen-street, Plymouth,
6th. January, 1830.

SIR,

I hope you will pardon the liberty I have taken in addressing you, which I do, in consequence of a strong report that has been made here, by some person unknown, and which is still in circulation,—that Captain King and the whole of the Commanders of packets have entirely set their faces against the metal cat and general purpose blocks invented by me; but I feel quite confident that you will do me that justice of not making a report against them without a just cause; it is needless for me to point out to you the prejudice there is in all new inventions, particularly those of a sailor.

I beg to make a few remarks on the blocks of the many ships that have been fitted out with them for these last four years. I have, at different times, taken out a boat in the Sound, in such weather as would almost render the attempt dangerous, for the express purpose of seeing whether there would be any difficulty in hooking the block when the vessel was pitching, and the only precaution I could see required, was merely keeping a strain on the back-rope until the slack of the cat-fall was hauled taught; some think that a similar report was made by the Boatswain of the *BRITANNIA*; *but that report*, Captain Hawker was perfectly satisfied, was incorrect, by seeing the block hooked himself, when she got under weigh to go up the Harbour after her summer's cruise. There is no vessel that has had more practice with them than the *PYLADES*, in the Irish and Bristol Channels.—The Captain and Officers, when fitting here in 1829, spoke in the highest terms of them. If there be any fault, according to your opinion, I should be happy, if it be in my power, to remedy it. Hoping you will cause me to be made acquainted with it,

I have the honour to be, Sir,

To

Your obedient servant,

Captain King.

J. BOTHWAY.

* See the *Britannia's* Certificate.

6th. April, 1830.

SIR,

Since first introducing the metal cat-blocks into the Navy, which is now nearly four years, I have availed myself of every opportunity of making any improvement that has shown itself. I have lately been informed that a block failed in the socket, in consequence of which, I have presumed to fit one, out of the number lately ordered and now sent in, on a different and more secure plan, namely with an iron socket made of the best fag-gotted scrap iron. I now beg, Sir, you will be pleased to appoint the Officers to inspect the same, and report thereon. Should their opinion be favourable, it is my wish to fit all the other blocks that I may be favoured with, on the same plan; the improvement will not increase the price of the blocks.

I have the honour to be, Sir,
Yours, &c. &c.

Commissioner Ross.

J. BOTHWAY.

Plymouth-Yard, 10th. April, 1830.

MR. J. BOTHWAY,

I directed the Officers of the Yard to inspect the improvement suggested in metal cat-blocks by your letter of the 6th. instant, and acquaint you that they report to me, that they consider the iron socket stronger than the cast metal one, and consequently an improvement.

I am,

Your obedient servant,
CHAS. B. H. ROSS.

Gunner

H. M. S. *Vaillant*,
Plymouth-Yard.

MACHINE FOR LIFTING CARCASSES.

Devonport, 13, Clowance-street,
6th. February, 1828.

SIR JAMES,

I beg leave to suggest, for your consideration, a plan for the greater dispatch of business at the slaughter-house of the Plymouth Victualling Department, as well as a probable saving of expense.

It will be allowed, I presume, that the following inconveniences attend the present mode :—Two tackles are employed to lift a carcass, and the whole of the butchers were required to be called off from their work, to assist, to the great interruption and delay of business in the late war; also, when the falls become wet and greasy, the difficulty is so increased, that they are obliged to lift by one tackle at a time.

From the above inconveniences results a delay which may, in many cases, be attended with serious consequences; as boats are frequently detained from their ships a very long time before they can be supplied—the cattle, perhaps, having been sent in late; and the present inconvenient mode of killing and preparing not admitting of the requisite dispatch for the sudden and simultaneous supply of a fleet.

My plan, of which the following is an outline, will, I trust, obviate these inconveniences :—No tackles or falls to be used, but a small machine to be set up, to enable every man to hoist up his own bullock without any other assistance. Four of these machines, on each side of the slaughter-house, will hoist 16 bullocks, which are as many, I understand, as are at present required at any one time; and these machines might be transferred to the new slaughter-house, when it is completed.

The expense of a machine complete, with two 3-8th. chains attached to it for hoisting, will be about 5*l*; and for every machine will be discontinued 4 double and single 12-inch iron-bound blocks, with their falls and cleats; also, 4 straps of 5½ inch rope and thimbles.

I trust, Sir James, my submitting the above for your

consideration will not be considered too presumptuous; as my motive is the benefit of the service to which I have the honour of belonging.

I am, Sir James,
Commissioner &c. &c. &c.
Sir J. A. Gordon, K.C.B. J. BOTHWAY,
 &c. &c. &c. *Royal Navy.*

The Honourable Commissioners have been pleased to direct a machine to be erected agreeable to the proposed plan.

COPY.

Victualling-Yard, Plymouth,
 12th. June, 1828.

REPORT ON MR. J. BOTHWAY'S INVENTION FOR HOISTING THE CARCASSES OF BEEF IN THE SLAUGHTER-HOUSE.

Having attentively inspected the machine contrived by Mr. Joseph Bothway, for suspending the carcasses of the oxen in the slaughter-house, we beg to submit the following report, as the result of our observations:—

The power afforded by the adaptation of this contrivance in hoisting is so very great, that, in comparison with the old method by blocks and falls, it may fairly be stated as four to one; and, at the same time, the new mode is equally expeditious and much more convenient.

In all other respects, the contrivance may be considered a very great improvement in the mode of hanging the beef in the slaughter-house.

(Signed.)

JOHN FRANKLYN, *Supt. of Wharf.*
 ROBERT BULCOCK, *Clerk of Cheque.*
 A. PIKE, *pro Storekeeper.*

Plymouth Victualling Yard,
18th. June, 1828.

SIR,

I have to desire that you will produce one of the machines, invented by you, for the purpose of hoisting the carcasses of oxen in the slaughter-house of this department, in order that the same may be sent to the Victualling Yard, at Deptford, in pursuance of the Board's directions of the 14th. instant.

I am, Sir,

Mr. J. Bothway,
Plymouth.

Your most obedient servant,
JAMES A. GORDON.

Plymouth Victualling Yard, 6th. July, 1828.

COMMISSIONER SIR JAMES GORDON

Acquaints Mr. Bothway, that the Board consider the expense of the machine, invented by him, for hoisting the carcasses of oxen in the slaughter-house, much greater than they anticipated; the bill is therefore not to be paid until the Chairman of the Board has inspected it; and the machine ordered for Deptford, to be suspended for the present.

12, Queen-street, Plymouth,
7th. July, 1828.

SIR JAMES,

I am in receipt of your note of yesterday's date, informing me that your Honourable Board considered the expense of the machine, erected by me, at the slaughter-house, much greater than they anticipated.

In explanation, I humbly beg to state, Sir James, that, before the machine was completed, I attended at the slaughter-house nearly four months, for the purpose of adhering to economy, and making every thing as simple as possible.

In my first suggestion, in March last, I proposed eight machines, at about 5*l* each; but from the many different

ways I have tried it, (and about which I have made a great sacrifice) I have now reduced it to one machine to do all the work.

The slaughter-house at the Plymouth-Yard being so small, the merits of the machine are lost; there is not width enough to take more than three oxen: if it were twice or three times as wide and thirty feet longer, the same machine would answer, with the addition of chain, and ninety oxen could then be stowed; consequently you would do away with 180 tackles and their materials.

The first cost of the machine, 9*l* 10*s*. with an addition of 1*l* 4*s*. 9*d*. for one iron snatch-block, two suspension chains with hooks, and three eye-bolts with nuts and washers, (that will be required for each oxen) will prove that I have reduced the first cost very considerably, and that I have studied the benefit of the service. I hope, Sir James, that this explanation will be to your entire satisfaction.

The machine ordered for Deptford is not quite complete; I have therefore stopped it agreeable to the Board's order, but I have every confidence in believing that, on the Chairman's examination of it, he will not find it necessary to cause the above machine (for Deptford) to remain on my hands.

To

I have the honour to remain

Commissioner

Yours &c. &c.

Sir James Gordon.

J. BOTHWAY.

GEAR AND SIGNAL-HAULYARD-BLOCKS, &c.

Queen-street, Plymouth, January 1st. 1829.

GENTLEMEN,

The observations I have been enabled to make, in the course of a long service, and more recently while superintending the manufactures of the metal cat-blocks

of my invention, which the Honourable Boards have been pleased to adopt, enable me to say, that I feel confident such an improvement may be made in our gear-blocks, as will combine strength, durability, and snugness, at the mast-head and on the yards; and should they be shot away, those I have the honour now to propose may be speedily replaced. In fact, the advantages they present, are such, that I feel encouraged humbly to beg that your Honourable Board will be pleased to order that H. M. S. WARSPITE, at this Port, may be fitted with gear-blocks on my plan: a favour which, the grateful remembrance of the liberality I have experienced, with regard to my cat-blocks, assures me, will not be denied; and which I hope will be used for the benefit of the Service. So confident am I of success, that I will guarantee the expense of a trial, should they not be found to answer your expectations.

	I am, Honourable Gentlemen,	
<i>The Honourable</i>	Your most humble servant,	
<i>Commissioners</i>		J. BOTHWAY,
<i>of the Navy Board.</i>		<i>Royal Navy.</i>

Navy-Office, 6th. January, 1829.

MR. BOTHWAY,

The Commissioners of the Navy command me to acquaint you, in answer to your letter of the 1st. instant, requesting that orders may be given for His Majesty's Ship WARSPITE to be fitted with gear-blocks on your plan, that if the Captain of the WARSPITE make an application to the Board to that effect, it will receive due consideration.

	I am,	
<i>Gunner,</i>	Your humble servant,	
<i>Royal Navy,</i>		G. SMITH.
<i>Queen-street, Plymouth.</i>		

COPY.

Queen-street, Plymouth,
7th. February, 1829.

MY LORDS,

I humbly beg leave to lay before your Lordships (Captain Shirreff of H. M. S. WARSPITE having kindly offered to convey the same to Town) a model and drawing of a plan for the better and more effectually securing a ship's lower yards. Also, a model of a gear-block, (of metal) which can be taken off or replaced in a very short time; whereby a considerable weight is taken from the mast-head of large ships, when at sea, and a considerable saving is effected in the wear and tear of gears while at sea.

I had wished to have been able to give your Lordships some idea of the expense of fitting a ship on my plan; but I find it impossible to do so without first making a set of iron work and blocks.

The durability and superiority of the metal cat-blocks will, I presume, be sufficient to recommend the use of metal for the gear-blocks, and induce you to think favourably of my present invention.

I humbly beg to suggest, for your Lordships consideration, and for the benefit of the Service, that if you were to order a small number of metal blocks aboard, on my plan, and fitted the same as the one now at the Navy Office, taking into consideration the many purposes they are so quickly converted to, it would greatly diminish the number of blocks of the large class now supplied for spare blocks, &c.

I remain,

To the

Right Honourable

The Lords of the

Admiralty, London.

My Lords,

Yours &c. &c.

(Signed) J. BOTHWAY.

COPY.

Queen-street, Plymouth,
7th. February, 1829.

GENTLEMEN,

I humbly beg leave to lay before your Honourable Board (Captain Shirreff of H. M. S. WARSPITE having kindly tendered his services to convey the same to Town) a model and drawing of a plan for the better and more effectually securing a ship's lower yards. Also, a model of a gear-block (of metal) which can be taken off or replaced in a very short time; whereby a considerable weight is taken from the mast-head, and a considerable saving is effected in the wear and tear of the gears while at sea.

Should your Honourable Board approve of my plan I humbly beg to solicit the favour of being allowed to supply the first ship that may be appointed to be fitted, on trial.

To the Honourable the I am,
Commissioners of H. M. Navy, &c. &c.
London. (Signed) J. BOTHWAY.

The Commissioners of the Navy were pleased to direct the WARSPITE to be fitted with slings and gear-blocks on my principle, on trial, the 17th. March, 1829.

COPY.

Plymouth, 13th. March, 1829.

I hereby certify, that I have this day closely inspected Mr. Bothway's proposed plan of iron slings for lower yards, suitable to a third-rate; and am of opinion, they are equal to the stress of forty tons, and are manufactured in the most durable manner.

I have also inspected his proposed metal gear-blocks, of 19½ inches, suitable for gear-blocks of a first or third rate ship; and am of opinion, they would carry away any common 28-inch wood block on the old plan.

(Signed) WM. KINGSTON,
Master Millwright,
Portsmouth Dock-Yard.

These are to certify the principal Officers and Commissioners of His Majesty's Navy, that the blocks of Mr. Bothway's invention have been in use on board H.M.S. ALLIGATOR, under my command, for nearly two years: they have been found to answer remarkably well for the purpose of hoisting the top-gallant sails or striking top-gallant-masts; also they make excellent burtons, &c.

Given under my hand, on board the said ship, the 17th. June, 1829,

C. YORKE,

Captain.

The blocks alluded to are two 6-inch treble, two 6-inch double, and one double and single 4-inch metal blocks: the property of Captain Yorke.

Queen-street, 17th. September, 1829.

SIR,

I beg leave to state, that, during my servitude in the Royal Navy, I have frequently witnessed the signal-haulyard carried away in signalizing, particularly in wet weather, which I have no doubt is, in a great measure, owing to the friction that must be, in the present mode of fixing the shivers in the trucks for the signal haul-yards.

In July last Captain Hawker, of His Majesty's Ship BRITANNIA, was pleased to give directions that a treble metal block, on my plan, should be fixed for trial at the main, which still remains, and one at the peek. I am now strongly of opinion that the single blocks will answer much better for the trucks; should any unforeseen accident happen with the treble block, then all three of the signal haulyards would become useless for the time. I have now complete, three single 3-inch blocks; and I am anxious to give them a trial, as I feel convinced it will be a great saving of rope, and expedite the working of the signals with much greater dispatch than on the old principle. I have not a doubt but the treble may answer

particularly well at the peek. Should you be pleased, after due trial, to cause a report to be made on them to the Navy Board, you will greatly oblige,

To Sir,
 Your humble servant,
Captain Burdett. J. BOTHWAY.

Queen-street, Plymouth, 27th, October, 1829.

To Captains, Commanders, and Officers of His Majesty's Royal Navy.

Mr. Bothway begs leave to state that he has now complete a *model* which he considers a very great improvement to that of H. M. Ship WARSPITE, which he recently fitted; namely the slings and gear-blocks.

Commissioner Ross having kindly proffered a room in the old check-office, for the reception of such Officers as may be pleased to favour Mr. Bothway with their inspection and opinion on his new-invented plans, for which purpose, Saturday, the 31st. instant, is fixed upon.

Mr. B., at the same time, will produce, for inspection of such Officers as may be pleased to attend, other new Inventions.

SIR, 2, Charlotte-row, Islington,
 20th. November, 1829.

I beg leave to state that I have a model of an improvement on the slings and straps of the lower yards, on that of His Majesty's Ship WARSPITE, recently fitted on my plan; also a gun-tackle and signal-haulyard-blocks. The high opinion entertained by the Admiral, Commissioner, Captains, and Commanders, as well as a great number of Officers on half-pay, who have very minutely inspected them, induced me to go to Portsmouth to lay them before the Committee there sitting; but on my arrival

D.

they had broken up; but I have them now at the Navy Office, and with the Honourable Board's permission, will attend personally, to describe them more fully than I can by writing.

I am, Sir,
&c. &c.

G. Smith, Esq.

J. BOTHWAY.

SIR,

2, Charlotte-row, Islington,
25th. November, 1829.

I beg leave to lay before the Society of Arts, Manufactures, and Commerce, a model of a new mode of fitting the slings, straps, and gear-blocks to the lower yards of ships; also a gun-tackle and signal-haulyard-block. The above are improvements on what has been recently fitted on board His Majesty's Ship *WARSPITE*, on my principle. The high opinion entertained by the Admiral, Commander-in-Chief at Plymouth, Commissioners Sir J. Gordon and Ross, and a number of Captains and Commanders in His Majesty's Navy, induced me to lay them before your Society.

I beg leave to make a few remarks on the advantages they possess over the present plans of the straps, &c. of the lower yards: great dispatch is made in rigging the yards, and with a considerable less number of men; from the method of the straps, every part bears an equal strain, and, when secured, it is impossible to injure the yards by friction; there is considerable less liability of their being shot away in action, or otherwise carried away, as the standing part of the slings terminates at the upper part of the trestle trees. From the principle they are on, all the stress of the yard is taken off them.

The gear-blocks, when the ship goes to sea, are taken down in a short space of time, and a substitute put in their place, when down, as preventer slings; in going into action or into Harbour, they are also replaced in a very short time. The gun-tackle will also make very

considerable dispatch in first fitting out; it will do away with strapping and pointing in transporting or training guns; from the construction of the blocks and hooks, they cannot be split in the way they are so frequently done, in the present method, in performing that part of duty. The only vessel fitted with them at present, is Lord Yarborough's yacht. His Lordship has been pleased to speak very highly of them, and various others, on my principle, on board his Lordship's yacht.

The signal-haulyard-block is intended to do away with the shieves in the trucks. His Majesty's Ship *BRITANNIA* is the only ship at present fitted with them on trial; she had them in use nearly five months previous to her sailing from Plymouth, in September, 1829. Their appearance under the trucks is remarkably snug; and, from the construction of the block, the signals are worked with great ease, particularly in wet weather; and there cannot be a doubt, but there will be a great saving in the wear of the signal-haul-yards.

It is needless, Sir, for me to point out to your Committee, the many disadvantages under which Nautical men labour, in comparison with mechanical men, in bringing any thing forward for the public benefit: and it is seldom or ever they enjoy the reward of their labour. During many years' experience in the Navy, I have seen an incalculable number of blocks (particularly those of the large class) decayed in ships' holds, and also in Foreign stores being destroyed by insects and other causes.

I have the honour to be, Sir,

A. Aikin, Esq. F.R.S.

&c. &c.

§c. §c.

J. BOTHWAY

P. S. As I am only in London for a short period, perhaps the Committee will allow me to exhibit and explain my models before them, at an early opportunity, as I shall be better able to explain them personally, than by a written communication.

SIR, Society of Arts, &c. Adelphi, London,
21st. December, 1829.

I have the pleasure to acquaint you, that the Society instituted for the encouragement of Arts, Manufactures, and Commerce, have rewarded your blocks, gears, &c., for the lower yards of ships, with their *Silver Medal*, on condition of your furnishing a complete model or drawing of the same.

You will have due notice, personally to attend, to receive the said reward from the hands of His Royal Highness the Duke of Sussex, President.

I am, Sir,

Your obedient Servant,

ARTHUR AIKIN,

Mr. J. Bothway.

Secretary.

Queen-street, Plymouth, 26th. March, 1830.

SIR,

Having, by your permission, on the 21st. instant, superintended the hauling up one of the lower-deck ports of H. M. S. St. VINCENT, with as few hands as possible; the duty was performed, in the presence of the Officers, by four men, on the plan now practised in H. M. Navy; one man bearing out the Port, the other three at the runner and tackle; after which, the same number of men were placed to make a purchase on two 4½-inch double metal blocks on my principle: by such purchase the port was hauled up with ease. The advantage gained by the latter is, the doing away the use of the following articles: viz, the runner-block, the two tackle-blocks, the runner, and the two hooks and bolts from the beams. The charge for the said articles you are in possession of, from H. M. Dock-Yard.

I beg to state, that a pair of blocks of my invention substitutes the above-named articles; the cost of which, at per pair, will be *one pound, six shillings, and six-pence*; and when unserviceable, their value, as old metal, about *seven shillings*.

On submitting to your notice a few remarks on the superior advantages of using the block in preference to the old mode, I trust you will not deem me intrusive. Considerable dispatch will be made in first fitting out, as there is no strapping, seizing, or pointing required; their great durability and snugness render them less liable to be shot away in action; and if, from the latter or any unforeseen accident, they should become unserviceable, they can be replaced in a few minutes; and their value, also, after becoming unserviceable, is a consideration.

Should you be pleased to approve of the plan I have the honour to submit, and make application for the *ST. VINCENT'S* ports to be fitted with the blocks, you may rely on my strict attention to your commands, to see them well executed in a workman-like manner, to ensure your approbation.

I have the honour to be, Sir,

Your most obedient humble servant,

Capt. Hawker.

J. BOTHWAY.

P.S. The fall is not included in the expense given you from the Dock-Yard, as the same fall will answer; but near three feet can be saved in the length; and, by my method, the purchase being in the centre of the portropes, it will considerably lessen the friction. There will be a bolt in the beam, for every port, to hook the inner block, which is to be added to the expense, at about *sixpence* per bolt.

In consequence of the time being nearly up for paying off the *BRITANNIA*, *Capt. Hawker* did not apply to the Board, on the above occasion.

Queen-street, Plymouth,
3rd. May, 1830.

SIR,

I beg leave to state that it is upwards of twelve months since *H. M. S. WARSPITE'S* lower yards were fitted with slings and portable gear-blocks on my

principle; and from the favourable report I have received of their superior utility, I take leave, with permission, to present to your notice a few brief remarks on the advantage derived by the Service, in their use. Every part of my slings bears an equal strain; and should the sea-slings be shot or carried away in action, or on a lee shore, with my preventer the yard is brought up in about three inches drop, and then worked as well by it as the sea-slings. Great dispatch is also made in rigging the yards. The WARSPITE's yards, from the time they were sent for from the ship to H. M. Dock-Yard at Plymouth, for the purpose of drawing the slings and gear-blocks, were rigged and swayed up in the short space of six hours. I have also been informed of the necessary fit-out that was required in the rigging, &c. on the arrival of the WARSPITE at Rio; that the gears and blocks were stowed down in the store-rooms; and that Captain Shirreff tried, as an experiment, the time it would take to replace them; which was performed in less than one hour after the hands were ordered up for that purpose. I further beg leave to state that I have submitted an improvement on them, with the model, at the Office of Commissioner Ross, for the inspection and opinion of all the Officers that may be pleased to examine it. I have also been in attendance at all the Nautical Boards in London, and the Society of Arts. The latter were pleased to vote me a *medal* for the Invention. From the high opinion generally entertained of them by each respective Board, and by many experienced Officers of the Royal Navy, I indulge in the hope that they will soon come into general use in the Navy; and should you, Sir, be pleased to approve of the Invention, and make application to have the yards of H. M. S. Caledonia, under your command, rigged on the improved principle, as presented by the model now at the Navy Board, I beg to assure you that every attention shall be paid by me, in having your commands executed in the best possible workmanlike manner, to merit your approbation.

I am, &c. &c.

Captain Curry.

J. BOTHWAY.

SIR,

Queen-street, Plymouth,
3rd. May, 1830.

By permission of Captain Hawker, of H. M. S. *St. VINCENT*, I beg leave to state that an experiment was tried on board that Ship, the 21st. March last, for the purpose of ascertaining the least number of men it would take in getting up one of the lower-deck ports. On the plan now practised in H. M. Navy, it was found not to be practicable with less than four; the plan I suggested was tried, namely, with two double $4\frac{1}{2}$ -inch metal blocks made on my principle; the same number of men were required to perform it, but the duty is done with more expedition, and does not require the aid of the runner-block, the two tackle-blocks, the runner, nor the two hooks and bolts in the beam. I am also confident, in the manner my blocks will be fitted, that a considerable saving will be effected, in reducing the friction from the port-ropes as now practised. Their snug appearance is also a recommendation.

Should you be pleased to approve of my plan, I will, by your permission, fit out a port, for your inspection. The price of the articles that can be dispensed with, has been ascertained from the Dock-Yard at this Port, by Captain Hawker.*

I am, &c. &c.

J. BOTHWAY.

Captain Curry.

To the Editor of the Plymouth & Devonport Journal.

SIR,

By giving a birth to the subjoined, in your Paper, you will, I am confident, oblige many of your Naval readers.

I am, &c.

J. BOTHWAY.

* See Captain Hawker's Letter, 26th. March, 1830.

To the Officers of the Royal Navy.

GENTLEMEN,

I beg leave to acquaint you, that I have just completed three models, which are likely to be of some importance both to His Majesty's Navy, and to the Merchant Service.

As there are many old and experienced Officers, in these towns, who have been no strangers to cruises in time of war, in our fleets, squadrons, &c. for the space of 6, 8, 10, or, I may say with safety, 12 months, without dropping an anchor, they can bear me out in the assertion, that there are many things, in our Navy, which are susceptible of improvement.

I was impressed into His Majesty's Service, in 1796; and, from that period until the peace, was employed in active service, principally on Foreign Stations; and, although my many years' practice might entitle me to some confidence, I should be most happy to embrace the opportunity of having the opinion of those Officers in the Navy who may honour me with their remarks on the Inventions I intend laying before them. Many, I have no doubt, will coincide with me, that the saving of rope will be incalculable; and the power gained, immense. For the present, I shall confine myself to the exhibition of the three models I have just completed: namely, an improvement of the top and top-gallant-sheet-blocks, and the shieves in the mast, &c.; and a new method for securing the hounds of the top-gallant-mast from injury, and for preventing the eyes of the rigging from slipping over them.

At any future time, the many, and I may say, expensive models of improvement, which I have suggested since the peace, may be inspected by any Naval Officer, at my house, Queen-Street, Plymouth.

I have always followed the principle of fitting out my Inventions, for trial, at my own expense; and I do not hesitate to say, that all inventors who place any confidence in their plans, should follow a similar system

until the merits of their several improvements are put to a practical test.

Mr. Elliott, of the Royal Hotel, Devonport, has kindly offered me a room for the reception of such Naval Officers as may favour me with their opinions; where I shall be in attendance on Monday, the 19th. instant, from 11 o'clock until 3.

I am, Gentlemen,

Your most obedient servant,

Plymouth, July 15th. 1830.

J. BOTHWAY.

Queen-street, Plymouth,
20th. July, 1830:

GENTLEMEN,

I very respectfully beg to state to your Honourable Board, that, having considered a great improvement might be made in the shieves of the mast, so as greatly to reduce the labour, independent of the great saving of the rope; in consequence of the idea, I have had a complete set of models made for the following purposes: top and top-gallant-sheet-blocks, also a method of securing the hounds of the top-gallant-masts from being injured, as well as preventing the eyes of the rigging slipping down them.

I yesterday submitted the whole of the models and drawings to a numerous meeting of Naval Officers, (Sir M. Dixon, the Commander-in-Chief, being prevented, from indisposition) when Commissioner Ross and all the Captains present were pleased to express their highest opinion on them, and thought them likely to benefit the Service.

I beg respectfully to request your Honourable Board will be pleased to permit me to try the above in any ship that may be fitting at Plymouth, at my own expense, for trial.

I remain, Gentlemen,

With the greatest respect

Your obedient servant,

*The Commissioners
of the Navy, London.*

J. BOTHWAY.

Paragraph taken from the Plymouth and Devonport Journal, Thursday, July 22nd. 1830.

BOTHWAY'S TOP AND TOP-GALLANT-SHEET BLOCKS, &c.

A number of Naval Officers assembled at Elliott's Hotel, Devonport, on Monday last, for the purpose of inspecting Mr. Bothway's improvements of the top and top-gallant-sheet-blocks, and of the shieves in the masts, &c.; and a new method of securing the hounds of the top-gallant-mast from injury, and for preventing the eyes of the rigging from slipping over them. The merits of each were most minutely examined by the officers present; who were pleased to speak in terms of the highest approbation of Mr. B.'s ingenious Inventions, and the benefit the Service is likely to derive from them. These high encomiums from Officers so well qualified to judge of their merits, and the interest they evinced in behalf of Mr. B. has induced him to offer, to the Navy Board, to fit out any ship at this Port, at his own expense, on trial, agreeable to the models.

Paragraph taken from the Devonport Telegraph, Saturday, July 31st. 1830.

An experiment was made, on Thursday, at this Dock-Yard, before Sir George Cockburn, G. C. B. one of the Commissioners of the Admiralty, Commissioner Ross, and a number of Naval Officers, to show the power of a new machine, on the Hydrostatic principle, for setting up ships' rigging,—the Invention of Mr. Bothway, R.N. assisted by Mr. Mare, Engineer, worked by one man only. This machine lifted, with ease, and lowered, in perfect safety, a weight equal to 3 tons, 14 cwt. 2 grs. and Mr. Bothway stated, that with six men he would set up the rigging of any first-rate man of war without the assistance of any tackle; although it is now done

with all hands and requires eight tackles. In time of war, it frequently happens that the rigging is reported slack, when sufficient hands on board cannot be immediately spared to set it up; and thus, masts have been sprung or carried away, which might be preserved by this machine, worked by six of the crew only; who would not be missed from the other duties of the ship, when fitting out. It is also applicable for other purposes.*

These are to certify the principal Officers and Commissioners of His Majesty's Navy, that, during the time I had the command of H. M. S. BRITANNIA, from September, 1829, to May, 1830, the signal-haulyard-blocks, then in use, were furnished by Mr. J. Bothway, of Plymouth, on trial, at his own expense.

I further certify, that, from my own observation, I consider the blocks invented by Mr. Bothway, far superior to those supplied from the Dock-Yards; and, if generally adopted, would be attended with considerable advantage to the Service.

Given under my hand, on board the GANGES, in Portsmouth Harbour, this 8th. August, 1830.

GEO. BURDETT,
Captain.

SIR, His Majesty's Ship ST. VINCENT,
September 3rd. 1830.

What little trial has been made, in this Ship, of your cat-block, I have every reason to approve of it; and I have no doubt of its being a great improvement on the old cat-block. The signal-haulyard-blocks I also highly approve of.

I hope this slight testimonial will be of service to you.

I am, &c, &c.

To Mr. Bothway.

HYDE PARKER.

* See trial of the machine on board the Kent.

*Dimensions, Weight, Price, &c. of Cat and general purpose blocks required
for Ships of the undermentioned Rates of the Royal Navy.*

	Size. Inches.	Weight. cwt. qrs. lbs.	Price.		Value when unserviceable.	
			£.	s. d.	£.	s. d.
74 Guns up to 1st. Rate.....	17	3 2 15	21	7 0	7	1 1
50 64 Guns.....	15	.....	12	3 0	4	2 0
36 to 46 or 48	13	.....1	8	6 0	2	1 2
20 to 34	12	.....1	4	15 0	1	7 1
10 18 Sloops ..	10	.....0	24	9 0		
First-rate gear-blocks.....	18	Treble	18	16 6		
	18	Double				

The following Ships of H. M. Navy have been supplied with Bothway's new Metal Cat and general purpose Blocks :

1826	Success	1829	Lightning
	Warspite		Swallow
	Druid		Trinculo
1828	Britannia		Calypso
	Pylades		Royalist
	Trinculo	1830	St. Vincent
1829	Comet		Rein-deer
	Hope		Goldfinch
	Kent		Conflict
	Lyra		Clio
	Renard		Dryad

With Signal-haulyard-blocks :

1829	Britannia (at my own expense)
	Pylades (Captain Hayes' expense)
1830	Druid (Board Order)
	St. Vincent
	Kent
	Blanche
	Caledonia
	Conflict (Lieut. Smithers' expense)
	Trinculo
	Alligator (Capt. Yorke's expense)
	Dryad

BLOCKS of all sizes, of Mr. Bothway's invention may be had at his Manufacturers', Mr. J. MARE, Engineer, Plymouth; and Mr J. HEARLE, Brass & Iron Founder, Devonport. Letters to be post-paid.

I have no hesitation in certifying that Mr. Bothway's Raising Machine for Invalids, is a most useful invention. I have had occasion to witness the advantages resulting to the patient from its adaptation, in increased comfort, cleanliness, and steadiness with which an invalid may be moved; and I think I may venture to ascribe the preservation of a limb, in a bad case of compound fracture of the head of the tibia, principally to its use.

JNO. WILLIAMS, *Surgeon,*
Convict Hospital, Devonport.

7th. September, 1830.

Mr. ADOLPHUS DYER, Cabinet-maker and Upholsterer, 13, Union-street, Plymouth, has undertaken the manufacture of Bothway's Invalid Supporters and Raising Machines, under the inspection of the Inventor; and orders are respectfully solicited to be directed to Mr. Dyer. Letters to be post-paid.

DESCRIPTION.

THE MACHINE FOR RAISING INVALIDS AT FULL LENGTH, for the purpose of making or airing the bed, introducing any convenience, &c. can be applied in the most desperate cases, without disturbance to the patient, or the necessity of removing the upper bed-clothes: and *One Woman* may raise the heaviest patient with perfect ease. Its simplicity and portability

are such that there can be no difficulty whatever in adjusting or working the machine. It may be laid up in a small compass when not in use.

THE SITTING SUPPORTER enables Invalids if they have but the use of one hand, to raise and support themselves in any sitting position they may desire; it also offers the convenience of a small table attached, for taking refreshment on, writing, reading, &c.; while its extreme simplicity and portability embrace every such convenience that can be desired. Patients who are occasionally confined to their beds, by gout, and other complaints, should never be without one of these machines, as presenting a great alleviation to the tedium of such a situation; and it is also recommended to Ladies, as a comfortable support after an *accouchement*, and calculated to facilitate their restoration. This machine, as well as the other, may be applied to any sized bed, without displacing the bed-furniture.

Testimonials, in proof of the utility of the above machines, may be seen at Mr. Dyer's, from Ladies and Gentlemen who have had them in use, and from Infirmarys, Dispensaries, &c. They have been considerably improved since the Society of Arts awarded me their *Silver Vulcan Medal*.

LAW OF PATENTS.

(FROM MINUTES OF EVIDENCE BEFORE THE SELECT COMMITTEE
OF THE HOUSE OF COMMONS IN 1829.)

Mr. Francis Abbott (Deputy Clerk of the Petty Bag Office) called in, and examined.

Have the goodness to state to the Committee the process of taking out a patent from the first application at the Secretary of State's office, or from the first putting in the petition, to the final sealing of it?—It is sometimes usual, although not necessary, to enter a caveat as the first step, which is considered a kind of precaution that a patent shall not be run against the applicant, as soon as it is known he is applying; for there are already caveats in, and immediately his reference comes to the Attorney-General it is circulated about, and if any casualty happens to delay him, there have been instances where somebody else has got a patent on the same subject, while he has been, for some cause or other, delayed; but it is usual in many cases to enter a caveat previously to making an affidavit; when, after entering the caveat, or without entering the caveat, the first step is the affidavit made by the person, that he has either invented, or has had communicated to him by a foreigner, some discovery. Having made that affidavit upon it, a petition is presented to the King, praying a grant of Letters Patent for England, Wales, and Berwick-on-Tweed, or with the addition of the Colonies: the Colonies are frequently omitted because it is attended with some extra expense, and in many inventions it would be of no use to embrace the Colonies:—that petition being presented to the King through the Secretary of State, a reference is made by the Secretary of State in the name of the King, to the Attorney or to the Solicitor-General to report. I am confining my observations now to the application for an English patent, not for an Irish or a Scotch patent.

The Attorney or Solicitor-General, on having the reference submitted to him, either makes a report in favour of the application, or it is stopped by caveats if there are any caveats; the clerk looks over the books, and finding any caveat for a patent on the same subject, the applicant is delayed a week from the time that notice is given for those who have received notices on their caveat to decide whether they will oppose or no. If within that week the person having had notice says he shall oppose, the next step is to take out a summons for the hearing before the Attorney or Solicitor-General. A week's notice more is given of that appointed time: he at that appointed time hears the parties if they attend; but it is too frequently abused by the parties who have said they should oppose, not opposing, and sometimes a patent is delayed a fortnight or three weeks; sometimes the Attorney-General cannot grant a patent; sometimes the Attorney and Solicitor-General are so occupied with other concerns they cannot attend; and a man is frequently delayed a fortnight or three weeks by somebody saying he shall oppose, and when the time comes, just at the hour of appearing, saying he does not oppose, or he does not attend; and instances have arisen, where patentees have been brought some hundreds of miles to support their application, and when arrived no opposing party has appeared. In a very recent case I was applying for a patent; I was delayed near a month just in that way; the intimation was given, but the party did not withdraw his opposition until the time appointed for hearing, and then he came and said, "I am not prepared," or "my party is not come," or something of that description. If the parties attend, they are heard before the Attorney or Solicitor-General, first the applicant, and then the opponent; and then, if he sees any reason to think there is an interference, he stops it: he exercises his own discretion on it, governed of course by what transpires on the examination of both the parties. If he thinks there is no interference between the applicant's and opponent's invention, he makes his report in

favour of the application; that report is taken back to the Secretary of State's office, for what is called the King's warrant; that warrant recites shortly that such a person has applied for a patent, and that the King is advised to grant it; and he, in general terms, directs the Attorney-General to prepare a patent for the King's signature; the warrant, as it is called, is taken back then to what is called the Patent Bill office; it is still under the Attorney and Solicitor-General, but not in their own private office; a separate office, which is exclusively appropriated to the engrossing of patent bills; it is taken back there, and in the course of a week, or sometimes more, the bill is prepared and signed by the Attorney-General or Solicitor, and taken back for the King's signature to it, and it is then called "the King's Bill:" the King having signed, it goes to the Signet office, where it passes, and then it is called "the Signet Bill:" from thence it goes to another office, when it undergoes the Privy Seal: then it is called "the Privy Seal Bill:" from the Privy Seal it goes direct to the Lord Chancellor's office, and receives the Great Seal: originally it used to pass another stage, which is now dispensed with; it used to go to the Hanaper, to pay the Hanaper fees on it; it is not now taken to the Hanaper office; but the Lord Chancellor's officer, the clerk of the patents at the Great Seal, receives the Hanaper fees, and pays them over; so that it does not now go to the Hanaper office; and then it receives the Great Seal, if there be no caveat: if there is a caveat, notice is given on it, and if the party says he opposes, then the applicant has no means of getting rid of that caveat but by a petition to the Lord Chancellor; those in modern times are very rare. When I first began to pass patents, they were much more frequent than at this time of the day, because at that time they were vexatiously resorted to in many instances, it being considered that the Lord Chancellor had no power to award expenses, however improper the opposition; but about thirty years ago—approaching to near thirty years, after mooted the question several times before the

Lord Chancellor, on a petition I presented, at last expenses were ordered to be paid by the person who had either not sufficient grounds, or did not appear to support them; in that case the Lord Chancellor did order expenses, and since it has been found that the expenses can be, and are frequently awarded at the Great Seal, the oppositions there are much less frequent than they used to be. When the caveat is removed, or if there is no caveat, it passes the Great Seal, and then it is completed.

That is the whole process?—That is the whole process as regards the English patent.

Now as to the Colonies?—It is only a little extra expense as to those, but it does not alter the system at all in any way; it is only an alteration in the prayer of the petition: instead of confining it to England, Wales, and Berwick-upon-Tweed, the petition adds—“And all your Majesty’s Colonies and Plantations abroad;” in other respects, it is the same process to pass it through the different offices; it is attended with no extra trouble, nor is there any separate document; it is all included in the same, only with those additional words, and it is attended with an additional expense, perhaps six or seven pounds. I generally recommend it to be dispensed with, for I have never yet seen any utility, in very few instances at least have I seen utility, in extending the patent to the Colonies.

The Committee have been informed, that when it is advisable to extend a patent to the Colonies, if you include one of the Colonies that has an independent legislature, it is necessary to obtain the consent of that legislature?—That has never occurred in my practice, and I was not aware of it; it is the first time I heard of such a practice.

Is the mode of taking out a patent for Ireland precisely the same?—Not exactly so: the first step is a similar affidavit and petition to the King; the prayer only praying it for Ireland, instead of England, Wales, and Berwick-upon-Tweed; then it is referred to the Attorney and Solicitor-General in Ireland, and it goes to the Lord

Lieutenant, the Attorney and Solicitor-General, I believe; and I think it goes to the Lord Lieutenant, who refers it to the Attorney and Solicitor-General; they make a report, and it comes back here for what is called the King's letter, something similar to the King's warrant on the English patent; that letter goes back to Dublin; then the patent goes through several offices, the minutæ of which I cannot tell the Committee, without I had some documents to refer to.

Are all these formalities requisite for a person who has previously obtained a patent in England?—Certainly; and a similar process is adopted to obtain a Scotch patent. The Scotch patent passes a seal that is called a "substitution for the Great Seal of Scotland," at Edinburgh; and the Irish patent passes the Great Seal at Dublin; the English one, the Great Seal here,—all three separate and distinct jurisdictions; the same expenses incurred; The Irish is rather more than the English, but you may average them all three at about coming pretty near; the Scotch and Irish taken together I average at about the amount of the English.

And what is the amount of the English?—There are so many circumstances that vary the amount, it is difficult to speak with any thing like precision: if I was to say upon an English patent with one name only, and not extending to the Colonies, including the fee for passing it, I think it is about £110; the solicitor or agent, or whoever passes it, has always, since I have been meddling with patents, more than thirty years,—has always had a fee of ten guineas on passing it; including that, an English patent with one name, and not referring to the Colonies, taking it at a round sum, would be £110.

That makes the whole expense for the United Kingdom £240?—If I am to understand England, Scotland, and Ireland, I should say certainly £330 for the three.

What length of time does it require, before the patent is sealed, for the three kingdoms?—I am to understand by that the three patents, instead of one patent?

Yes, the three?—The English patent depends so

much upon casualties, that you cannot mention the time; they used to be certainly more expeditiously obtained than they are now—certainly considerably more expeditiously obtained than now; sometimes now they are three months or more getting a patent. I have got two going on now, where, unless I get them to-day from the Secretary of State's, they have remained, I think, nearly a month waiting the King's signature to the warrant.

So that in England a patent may be three months?—Under some circumstances it has been certainly got often considerably below that period: a month or five weeks have been sufficient to get a patent in; but it is rarely, in modern times, you get it in twice that time.

And for an Irish patent, how long?—There it is longer: how to account for it I do not know; but you can seldom get an Irish patent in less than five or six months: it is the more unaccountable, by reason that the Royal signature is only required once for an Irish patent; they have it twice for an English patent, and it is only required once for a Scotch patent: and I cannot account for the great delay; and I have often, and every body who has had any thing to do with it have felt the great inconvenience they are put to, in getting a patent for Ireland; so much so, that I have often remonstrated, and had to press it on. I have frequently said, the patent is in danger of having the Irish patentee's right destroyed, inasmuch as he must specify in England, and any body may see that specification here on paying the office fees for search, and by sending over to Ireland the whole subject-matter of it, there is no patent right to prevent it being used there, and being used is completely destructive of the patent, if the patent has before that time passed the Great Seal.

Do not you know when it passes out of the Privy Seal office or the various offices which you have described? do you not know when it is forwarded from one office to the other?—Not in Ireland.

In England?—Yes.

You can tell where the delay generally arises possibly?—The greatest delay is, when, from any cause or other, the Royal signature cannot be obtained; in some instances where the great officers of state are in the country, then a patentee is put to an increased expense, or he will have to wait a month or two perhaps for the Privy Seal, unless he will pay an extra expense towards a journey; and upon some occasions patentees have actually paid considerable sums to make a journey on purpose where particular circumstances rendered it necessary that they should have the patent immediately, without waiting until any body else contributed towards the expense of the journey.

Several of these offices are merely formal; there is no act done except a signature; there is no impediment ever thrown in the way of a patent?—There is no impediment passing the Signet or Privy Seal office.

Where does it go to after it has got out of the Attorney-General's hands?—It goes back to the King for the King's warrant; then the Attorney-General prepares a bill for the King's signature, which is called the King's Bill; after that is signed the King's signature is not wanted any more.

In some of these offices is the operation merely formal, and there would be no mischief done if it was entirely passed over?—In a Scotch patent there is a much more expeditious method. I can get a patent, although I have to correspond with my agent in Edinburgh, I can get a patent there much more expeditiously than I can in England; in ordinary cases about half the time.

What is the cause of that?—Because it passes by what they call warrant; that is, the King's signature is only had once; as soon as the Lord Advocate of Scotland has made his report similar to the Attorney-General's report in England, the King issues a warrant, as it is called, which is a substitution for the King's Bill here; it differs a little in form.

Would there be any mischief in having the Scotch form introduced?—I should think it would be a very great improvement.

Is there any practical objection?—I am not aware of any practical objection.

You say that when a caveat is entered before the Lord Chancellor, he has the power of awarding costs; has the Attorney or Solicitor-General that power?—No; in one way they exercise it; it is a modern plan; in one way they to a certain extent exercise that power, and it arose on a case of my own when Sir Samuel Romilly was Solicitor-General. I had obtained his report in favour of the patent, and I had gone back and got the King's warrant, directing the patent to be made out in the intervening time; a person getting by some means knowledge that the patent I was soliciting had been reported on, he came and claimed to be heard on a caveat. I submitted to Sir Samuel Romilly that it was contrary to practice that a party should be heard at that stage, and in addition to that he had put my party to an increased expenditure by not coming at an earlier stage as he ought to have done; that was the first time it was ever admitted of permitting a party to be heard on the bill, as it is called: he then said, "I will let you, the opponent, in to be heard now; but it is upon this condition," and ever since that, it has been the rule, "that you shall pay the expenses that the other party has hitherto incurred, if I am of opinion the application ought not to proceed (and I think it has been subsequently altered to a further condition annexed to it), and if I am not of opinion that it should be stopped, you shall pay the expenses of this hearing." I believe something of that kind in some modern cases has been done. I am not clear about that, because that has not arisen in my own practice; at all events, since that time any person coming in the second stage before the Attorney-General on the bill, he is now made to deposit; some of them finding the Attorney-General had no judicial power to enforce the payment, refused to pay after they had been suffered to be heard. Well, then another remedy was adopted, "you shall deposit so much money," and thus stands now.

You mentioned the expense of a patent; you mentioned

a patent having one name; is the expense increased if the patent is taken out by several persons?—Yes.

In what proportion, can you tell the Committee?—I should think, in the Attorney-General's office it is very little; the Secretary of State's office in each stage there it is 1*l*. 7*s*. 6*d*. extra, in each stage through the Secretary of State's office; I think there is some little extra expense at the Hanaper; there is there an extra expense of 2*s*. 6*d*. or something like that in the Attorney-General's office; but there is a very large expense extra at the Signet and Privy Seal offices, for the addition of a name; I have selected those in anticipation that that would be enquired of me; I have extracted the charges there, as I thought I should not be able to make myself so well understood by words as by putting it on paper, the difference of expense in respect of one name and of two; the expense on one name at the Signet office is 4*l*. 7*s*.; on two it is 10*l*. 5*s*. 6*d*.; at the Privy Seal office it is 4*l*. 2*s*.; on two names it is 10*l*. 0*s*. 6*d*.; so that the addition at those two offices may be considered instead of 8*l*. 9*s*. is about 20*l*. 6*s*.

SIGNET OFFICE.		
	One Name.	Two Names
Fees and Stamps	£3 1 0	£7 13 0
Gratuity	1 1 0	2 2 0
Receiver and Assistant-Clerk	0 5 0	0 10 6
	£4 7 0	£10 5 6

PRIVY SEAL OFFICE.		
	One Name.	Two Names
Fees and Stamps	£2 16 0	£7 8 0
Gratuity	1 1 0	2 2 0
Record Keeper	0 5 0	0 10 6
	£4 2 0	£10 0 6

Is the expense increased before the Great Seal—the Chancellor?—I mentioned before, it is two pounds something; an extra fee at the Hanaper, but I believe in no other respect, which is received by the patent clerk at the Great Seal office.

The following Certificate was accidentally omitted in the former part of the book :

His Majesty's Ship Pylades,
25th. September, 1828.

We, the undersigned, do certify, that the cat-blocks invented by Mr. BOTHWAY, now in use aboard, are far superior, in every respect, to the old ones, and that we can cat our anchors with less strength; and should the block take a turn in the fall, when the cable is surged, it can be easily taken out by hauling on the back rope.

(Signed) JOHN G. D. URBAN,
Senior Lieutenant.
JOSEPH N. KING,
Master.

ERRATA.

In Note to page iv. of Preface,—*for May, read April.*

In Note to page v. of Preface,—*for 1830, read 1829.*

